AFS
SPW

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	
SHARPE, Elizabeth, et al.	Examiner: B. To
Serial No.: 09/670,635	
Filed: September 26, 2000	Art Unit: 2162
For: METHOD AND SYSTEM FOR ARCHIVING AND RETRIEVING ITEMS BASED ON EPISODIC MEMORY OF GROUPS OF PEOPLE	

TRANSMITTAL OF APPEAL BRIEF

Mail Stop Appeal Brief- Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Attention: Board of Patent Appeals and Interferences

Sir:

Attached hereto is Appellants' Brief for the above-referenced application. The Commissioner is authorized to charge the requisite fee in the amount of $250.00 (small entity) as set forth in 37 CFR 41.20(b)(2) and all other fees associated with this submission to Deposit Account No. 11-0600.

Respectfully submitted,

Date: May 15, 2006

Robert L. Hails, Jr.
Registration No. 39,702

KENYON & KENYON LLP
1500 K Street, N.W.
Washington, D.C. 20005
Ph.: (202) 220-4200
Fax.: (202) 220-4201

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	
SHARPE, Elizabeth, et al.	Examiner: B. To
Serial No.: 09/670,635	
Filed: September 26, 2000	Art Unit: 2162
For: METHOD AND SYSTEM FOR ARCHIVING AND RETRIEVING ITEMS BASED ON EPISODIC MEMORY OF GROUPS OF PEOPLE	

APPEAL BRIEF

Mail Stop Appeal Brief- Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Attention: Board of Patent Appeals and Interferences

Sir:

Applicant submits this appeal brief in the above-referenced application. A notice of appeal was filed on March 15, 2006.

TABLE OF CONTENTS

REAL PARTY IN INTEREST

6S, Ltd. is the real party in interest for all issues related to this application. 6S, Ltd. owns this patent application by virtue of an assignment recorded with the Office at reel 011480, frame 0535.

RELATED APPEALS OR INTERFERENCES

There are no other appeals or interferences related to this application.

STATUS OF CLAIMS

This application contains claims 1-27 and 58-67, all of which stand rejected as obvious over prior art. All rejections are appealed.

STATUS OF AMENDMENTS

No amendments have been filed subsequent to the final rejection in this application.

SUMMARY OF CLAIMED SUBJECT MATTER

The present invention provides methods and systems to tailor indexing and retrieval of digital media items based on episodic memory of predefined groups of people. A system implementing aspects of the invention will generally be directed at one or more predefined groups of people, such as families, work groups, and sports teams. When a user operates the system, he is identified as a member of a group. The user may then archive digital media items based on event types, other users in the group and/or dates and times. These categories and attributes are predefined and associated with the group to which the user belongs. Similarly, when a user wishes to retrieve digital media items from the system, he identifies himself and is recognized by the system as being a member of a particular group. The user may then retrieve digital media items based on criteria that are specific to that group.

The invention also allows for digital media items to be stored and retrieved as "high points" – that is, digital media items that represent or embody a particularly memorable moment for the group. Users may also define "trails" of digital media items, where a set of media items are arranged in a logical or meaningful order as perceived by a member of the group. Trails can be retrieved and displayed automatically, i.e., after a user selects one of the elements of the trail, or manually, when a user follows one media item in the trail to the next. The use of trails and high points enhances the nostalgic experience provided by the episodic archival and retrieval systems. Compared to semantic retrieval systems, i.e. those where an item is identified by describing facts about it or concepts related to it, an episodic archival system is based on remembered events. Thus it provides many benefits in recording the common memories of members of a group. Instead of archiving and retrieving media items

based on their content, users may do so based on the mutual significance that each media item has to the group.

Archival of Media Items by Group Members

First, a group of users 1 is registered 2 with the system. The group is stored in a database 3. Members of the group may then work together to archive digital media items, such as audio recordings, digital photographs, digital video clips, and the like. When a user wishes to use the system, he first provides identifying information such as a name and password; this information identifies him as a member of a group. The user can then import one or more digital media items 6 into a workspace. The system generates identifiers

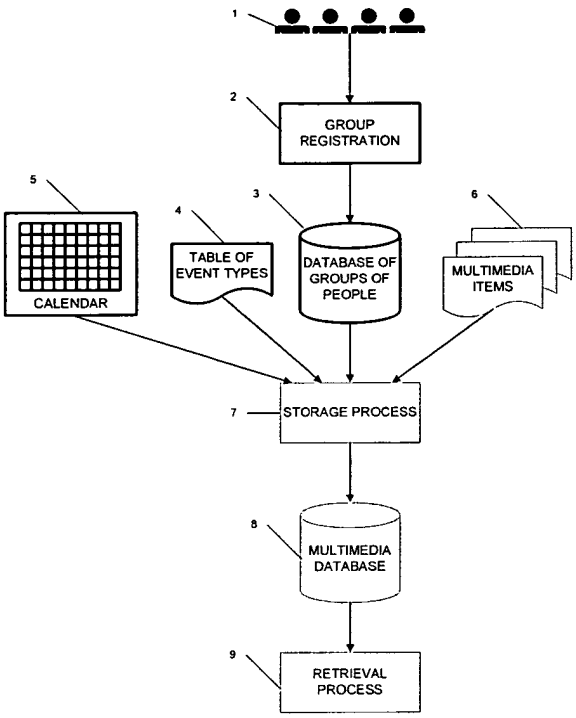


Fig 1

that can be associated with each item. For example, the system may provide lists of people 3, event types 4, and/or dates 5 with which each digital media item may be associated. For each digital media item, the user can choose information from each list to associate with the item. Index information is created for each combination of digital media item and chosen information in a storage process 7, and the item is then stored in a multimedia database 8. When a user later wishes to retrieve a digital media item, he may do so by specifying one or more users, types of events, and/or dates and times 9. *See* Figs. 6-7 and pp. 12-14 of the application.

Users may also indicate "high points" (media items that are especially significant) and "trails" (a sequence of media items arranged in a particular order).

The information available for a user to associate with a media item is determined based on the user's membership in a group, as defined in the group registration process 2. A user is only presented with options relevant to the group of which he is a member. Thus, a group of users can utilize the system to record media items related to event types, people, and dates that are common to members of that group.

Claims 1, 58, and 66 capture the archival of digital media items. Claim 1 recites that, when user input identifying a group to which a user belongs and data identifying information about a digital media item are received, index information based on the input is created. The indexing information is then stored in association with the media item. Similarly, claim 58 recites that, when an operator is identified as a member of a group of users, candidate information values based on the group to which the operator belongs are identified. The user is then queried for a selection of identification data to be associated with a digital media item. Index information is created based on the operator's response, and stored in association with the digital media item. Claim 66 recites that a database is built when user input identifying a social group to which the user belongs is received. The database is comprised of the digital media items provided by the user and index information created from archiving input data received from the user.

Retrieval of Media Items by Group Members

After digital media items have been archived in the system, users may wish to retrieve a selection of the archived items. To do so, a user first presents identifying information to the system and selects retrieval parameters 90. As described above with reference to the archival process, the types of retrieval parameters presented to a user may be determined from the group to which the user belongs. The user may choose to retrieve media items that are designated as "high points," to follow predetermined "trails," or to retrieve items associated with one or more people, time periods, and/or event types. *See* pp. 14-15 of the application. Indexing information based on the parameters selected by the user is created, and items matching the indexing information are identified 91 and presented to the user 92. Other navigation options may be presented to the user, such as following a trail if one or more of the presented media items is a trail item 93-94.

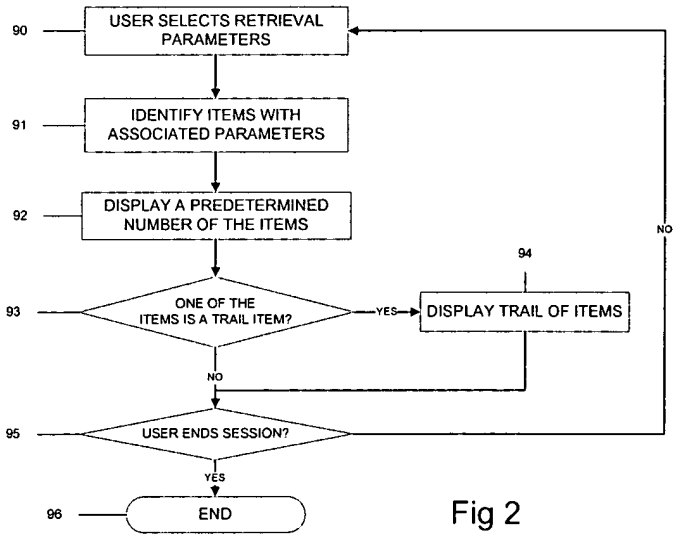


Fig 2

Claims 1 and 62 capture the retrieval of digital media items. Claim 67 captures methods for searching and retrieving archived media items. Claim 1 recites that digital media items are retrieved based on input data representing a selection of group event types, one or more people in the user's group, and/or a time period. Claim 62 similarly recites a method of authenticating an operator as a member of a group and providing information for selection by the operator based on the operator's group membership. The operator is then queried for

selection of identification data that includes selections of event types, persons, and/or time periods. Index information is generated from this data, and stored media items corresponding to the index information are retrieved. Similarly, claim 67 recites identifying candidate information values based on a social group of which a user has identified himself as a member. A query is then displayed, which identifies the candidate information values. Based on a user's selection of criteria such as even types, persons from the group, and/or time periods, a database is searched for digital media items satisfying the selection criteria. The digital media items are then retrieved and may be presented to the user.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether the outstanding §103 rejections to claims 1-27 and 66 over Shneiderman et al., "Direct Annotation: A Drag-and-Drop Strategy for Labeling Photos," July 2000 ("Shneiderman") in view of E.P. 0 678 816 A2 to Mizoguchi ("Mizoguchi") should be reversed.

2. Whether the outstanding §103 rejections to claims 58-65 over Shneiderman in view of U.S.P. 5,485,611 to Astle ("Astle") should be reversed.

3. Whether the outstanding §103 rejections to claim 67 over Mizoguchi in view of Shneiderman should be reversed.

GROUPING OF CLAIMS

The claims do not stand or fall together. The argument provides a detailed discussion of the elements of the various claims.

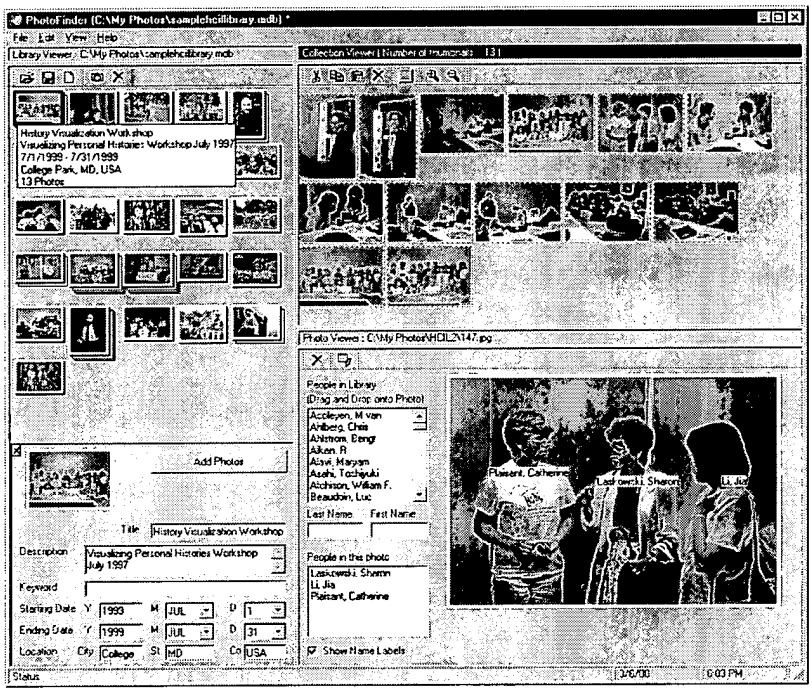
ARGUMENT

The obviousness rejections to claims 1-27 and 58-67 must be reversed because the references, even when taken collectively, fail to teach or suggest the subject matter of the pending claims.

An obviousness rejection must satisfy three basic criteria. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ 2d 1438 (Fed. Cir. 1991); MPEP § 2142. Because the cited art in this application simply does not teach or suggest all claim limitations, the appealed rejections must be reversed.

The Examiner's primary reference, Shneiderman, discloses a system for labeling photographs in which a user can select a label to be placed on a digital photograph from a list, and drag the label onto the photograph. A name only has to be typed in the first time it appears in a photograph. A user interface to the system described in Shneiderman is shown in Fig. 3. It includes areas in which a user can inter a title, description, and keywords; start and end dates; and a location describing the current photograph (bottom left). A user can also type in a name with which to annotate the photograph, or select a previously-used name from a master list (bottom center). *See* Shneiderman, p. 4, Figure 4; p. 6, col. 2. The photographs being annotated are stored in a file on the computer ("C:\My Photos\samplehcilibrary.mdb" in

the title bar). *Id.*, Fig. 4; p. 7. Notably, the entire list of people names stored in the application is presented each time an operator wishes to annotate a photograph. *Id.*, p. 5, col. 1. There is no indication or suggestion that the list of names available as annotations is linked to or dependent on the operator of the program. The list of names is stored in a database table, and there is no indication in Shneiderman that the names are associated with groups. *See id.*, p. 7, col. 1; Figure 6.



Shneiderman's FIG. 4.

Mizoguchi discloses a method of generating image data which allows for searching the image data at a high speed. Mizoguchi, abstract. The time at which a photograph is taken with a digital camera is compared with a predetermined time range; information corresponding to the predetermined time range is stored with the image. *Id.* A schedule of events is stored in the camera. When a picture is taken with the camera, any data associated with the time the picture is taken is then used to index the picture. *See id*, col. 7, lines 26-42. The methods and

systems described in Mizoguchi rely on the camera having electronic notebook, scheduling, and data management functions. *See id*, col. 7, lines 1-5. For example, a person may schedule a golf game with three other people, for a specific date and time, in the scheduling component of the camera. When a photograph is taken during the golf game, the photograph is associated with the event ("golf") and the date, time, and other people listed on the schedule. *See id*, col. 8, lines 26-42. Stored photographs may then be searched by this associated data. *See id*, col. 10, lines 34-47.

Astle describes a method for generating a video database index, where video sequences are indexed based on index frames. *See* Astle, abstract; col. 6, lines 9-11. An index frame is selected based on the amount of change in scenes depicted in the video database; each index frame represents a video sequence. *Id.*, col. 6, lines 4-11. In the background section, Astle describes indexing a video sequence by denoting the location of the sequence on a particular video cassette by a time index or a counter index. *Id.*, col. 2, lines 11-25.

None of the cited references disclose any system for leveraging the episodic memory of a social group of people. That is, the references fail to disclose or suggest a retrieval system that permits nostalgic retrieval among a broad set of digital media items – beyond merely photographic items – or permits operators to browse among such sets of items. When compared against the requirements of the pending claims, it becomes clear that the claims define patentable inventions over this art.

Rejections under 35 U.S.C. § 103(a) over Shneiderman in view of Astle

Independent Claims 58 and 62

Claim 58 recites a media archival method; claim 62 recites a related media retrieval method. These claims stand rejected as obvious over Shneiderman in view of Astle. Both claims read, in pertinent part:

> authenticating an operator ***as a member of a group of users***,
> identifying candidate identification values ***based upon the group with whom the operator is authenticated***,
> querying the operator for selection of identification data to be associated with a digital media item, ***the query identifying the candidate identification values and including valid selections of an event type and persons from the group*** and time ...

None of the cited references teach or suggest this subject matter. None of the references teaches or suggests the step of authenticating an operator as a member of a group of users, identifying candidate identification values based on the group or providing a query that includes valid selections of an event type and persons from the group. Accordingly, the rejections to claims 58 and 62 must be reversed.

The Examiner argued that Shneiderman, in FIG. 4, teaches the authentication step in FIG. 4. In both the Dec. 12, 2005 and Jan. 26, 2006 Office Actions, the Examiner argued that the reference to C:\My Photos\samplehcilibrary.mdb demonstrates a log on process that corresponds to the authentication step. The Examiner is wrong. Shneiderman's reference merely identifies a location of an mdb database file in an ordinary computer file system. Claims 58 and 62 specify that the authentication step authenticates an operator as a member of a group of users, then further uses this group-based information to govern further operation of the respective methods. Shneiderman's disclosure is not so specific as to describe any process that authenticates an operator as a member of a group of users. None of the supplementary

art is cited for this disclosure. This is a first basis on which to reverse the Examiner's rejection to claims 58 and 62.

Additionally, Shneiderman fails to teach or suggest identifying candidate identification values ***based on the group with whom the operator is authenticated*** or querying an operator including valid selections of an event type and persons ***from the group***. These features, which correspond to the principles of episodic memory described in the specification, are lacking from any reference. Shneiderman allows an operator to enter names and description information simple as freestyle text. For convenience, an operator may drag-and-drop previously entered names from a pull down menu onto a photograph. *See* Shneiderman, p. 5, col. 1. Shneiderman has no disclosure, however, to support an inference that his system poses queries to an operator using identification values that are based on the group or it includes within those queries valid selections of an event type or persons from the group. Freestyle text entries and drag-and-drop operations are insufficient to meet the substance of these claim elements. None of the supplementary art is cited for this disclosure. This is a second basis on which to reverse the Examiner's rejection to claims 58 and 62.

Applicants clearly explained the deficiencies of the cited art during prosecution. *See* Response of July 15, 2005; Response of Feb. 10, 2006. The Examiner never directly addressed the arguments, but in reply merely repeated verbatim the previous rejections. *See* Office Action, p. 7-9 (Jan. 26, 2005); Office Action, p. 9-10 (Dec. 12, 2005). Of course he cannot, because the art does not teach or suggest this subject matter. The cited art does not teach the principle of archival based on episodic memory nor does it teach the claim elements cited above.

Dependent Claims 59 and 63

Claims 59 and 63 depend respectively from claims 58 and 62 and further recite that the candidate identification values for persons include names of **group members**. The Examiner relied on seemingly random disclosures of Shneiderman in making obviousness rejections of these claims. The Examiner asserted that the use of "names of group members" in claims 59, and 63 was rendered obvious by Shneiderman's disclosure that a user may select names in the library. It is unclear what relationship the Examiner sees between the use of group member names and photograph annotations. The group member names of claims 59 and 63 refer to groups of users **of the archiving system**. In contrast, the person names and descriptions disclosed in Shneiderman are annotations referring to the *contents* of the annotated photographs. There is no relationship between the names in the master list and the operator of the program in Shneiderman. The art simply is not relevant to the archival process recited in the claims. The rejection of claims 59 and 63 is incorrect and should be reversed.

As with claims 58 and 62, Applicants have explained these differences to the Examiner, but Applicants' arguments have never been addressed.

Dependent Claims 60 and 64

Claim 60 depends from claim 58; claim 64 depends from claim 62. Both claims recite the additional feature that the stored index information includes a flag that distinguishes **high point** items from other items. The Examiner claimed that the use of a high point flag in claims 60 and 64[1] was rendered obvious by Shneiderman's disclosure of "show name labels." Office

---

[1] In the Office Action of Dec. 12, 2005, the Examiner identified claims 61 and 65 as relating to setting a high point. Claims 61 and 65 do not recite a high point; rather, they are directed to the use of a trail. Presumably, this rejection was meant to apply to claims 60 and 64. It is unclear to what the rejection given for claims 60 and 64 is directed. Regardless, the cited art is irrelevant to the claims.

Action of Dec. 12, 2005, p. 10. The fact that annotations may be shown on a photograph in Shneiderman has no relation to the use of the high point flag recited in claims 60 and 64. As clearly described in the specification, the high point flag allows archiving users to mark a digital media item as related to a particularly memorable event. An example of such an event is a group's last day of school. *See* application, p. 12. In contrast, Shneiderman merely refers to displaying names of people in a photograph. The disclosure of Shneiderman is simply not relevant, and the rejection of claims 60 and 64 is incorrect and should be reversed.

As with claims 58 and 62, Applicants have explained these differences to the Examiner, but Applicants' arguments have never been addressed.

Dependent Claims 61 and 65

Claim 61 depends from claim 58; claim 65 depends from claim 62. Both claims recite the additional feature that if a digital media item is a member of a **trail**, the index information includes an identifier representing the media item's display position **in a sequence of stored media items**. None of the cited art teaches or suggests that use of a "trail" as recited in the claims and described in the specification. The Examiner has never given a satisfactory reason for rejecting these claims. In two consecutive Office Actions, the Examiner rejected both claims on the reasoning the Shneiderman discloses the use of a "high point." Office Action of Jan. 26, 2005, p. 9; Office Action of Dec. 12, p. 10; *see* footnote 1, above. However, claims 61 and 65 recite the use of a trail, not a high point. The rejection of claims 61 and 65 is baseless, and should be reversed.

As with claims 58 and 62, Applicants have explained these differences to the Examiner, but Applicants' arguments have never been addressed.

Rejection under 35 U.S.C. § 103(a) over Mizoguchi in view of Shneiderman: Independent Claim 67

Claim 67 was rejected as obvious over Mizoguchi in view of Shneiderman. It recites:

A method of searching digital media items, comprising:

receiving a user input **identifying a social group** for which a search is to be conducted;

identifying candidate identification values **based upon the social group**,

displaying a query that identifies the candidate identification values and including **valid selections of an event type for the social group**, persons from the social group and time,

responsive to selection criteria made in response to the query, searching a database and retrieving digital media items that satisfy the selection criteria.

As previously explained, Shneiderman fails to teach or suggest identification of social groups, identifying candidate identification values based on the group or displaying a query that includes valid selections of an event type for the group. The Examiner admitted that Mizoguchi does not disclose identifying candidate identification values based on a social group. Office Action of Dec. 12, 2005, p. 8. Therefore, the rejection should be reversed.

Rejection under 35 U.S.C. § 103(a) over Shneiderman in view of Mizoguchi

Claim 66

Claim 66 was rejected as obvious over Shneiderman in view of Mizoguchi. It reads:

A method of archiving digital media items, comprising:

receiving a user input ***identifying a social group to which an archiving user belongs***;

building a database that includes:

digital media items to be archived for the social group, and

index information for the digital media items, each instance of index information created from archiving input data identifying a user's response to a query that identifies a plurality of event types ***previously registered as associated with the social group***, and persons ***previously registered as members of the social group***.

The cited art fails to teach or suggest all elements of this claim. No reference, for example, suggests that index information is derived from a query that identifies event types that have been previously registered as associated with a social group. Although Shneiderman refers to event information generally, he has no disclosure to suggest that event information is selected **from a query that identifies event types**. Shneiderman certainly does not disclose that these event types are ***previously registered in association with a social group***. Mizoguchi discloses no use of social groups or event types associated with social groups. The cited art fails to teach or suggest all elements of claim 66 even when considered collectively and, therefore, this rejection must be reversed.

This argument also was presented to the Examiner in the Response to Final Office Action of February 16 and left unrebutted. The Examiner merely asserted that the arguments were not persuasive. The Examiner's indifference to these arguments is surprising, given the relevance these features hold to the episodic memory principles that underlie the pending claims.

Claim 1

Claim 1 stands rejected as obvious over Shneiderman in view of Mizoguchi. It reads:

> A method of archiving and retrieving digital media items, comprising:
> receiving a user input **identifying a group of users to which an archiving user belongs**;
> receiving archiving input data identifying: a digital media item to be archived for the group, **the user's selection of zero or more group event types from a predetermined plurality of group event types specific to the group, the user's selection of zero or more persons in the group**, and the user's selection of a time period;
>
> • • •
>
> receiving retrieval input data representing **a selection of a default or zero or more group event types from the predetermined plurality of group**

> **event types for the group, a selection of a default or zero or more persons in the group**, and a selection of a time period; and
>
> using the selections **and the identified group** to retrieve and output digital media items that match the selection.

The Examiner concluded that Shneiderman teaches the first five steps, and that Mizoguchi provided a way to modify the steps alleged to be taught in Shneiderman to include the last two steps. The Examiner did not demonstrate a motivation in either reference to combine the teachings of Mizoguchi with the teachings of Shneiderman. During an interview held February 9, 2006, the Examiner suggested that the references' failure to describe every element of the claims is a minor omission.

The Examiner incorrectly interpreted the disclosure of Shneiderman. In the Office Action mailed December 12, 2005, the Examiner asserted that Figure 4 of Shneiderman teaches receiving a user input identifying a group of users to which an archiving user belongs, and the user's selection of zero or more persons in the group and zero or more group event types from a predetermined plurality of group event types.

Contrary to the assertions by the Examiner, Shneiderman does not disclose a log in process. The application described in Shneiderman permits an operator to enter names as freetext and provides a window with previously-stored names, with the most commonly-used names listed at the top. *See* Shneiderman, p. 5, col. 1. Mizoguchi similarly provides for entry of names and events by an operator of the device. Neither reference refers to **groups** of users. They certainly do not describe selecting group event types or persons, where the selections are based on a group of which the **archiving user** is a member.

These arguments were presented to the Examiner during prosecution. *See* Response to Office Action of July 15, 2005; Response to Final Office Action of Feb. 10, 2006. The Examiner

has never addressed the arguments, but in reply merely repeated verbatim the previous rejections without additional comment. *See* Office Action of Jan. 26, 2005, p. 3-5; Office Action of Dec. 12, 2005, p. 3-4.

The art cited by the Examiner simply does not teach or suggest the subject matter of claim 1. The obviousness rejection of claim 1 is incorrect and should be reversed.

Dependent Claims 2-13

Dependent claims 2-13 depend directly or indirectly from claim 1 and recite additional limitations which capture other aspects of the invention. Specifically, these claims recite elements incorporating the following:

- retrieving digital media items using a group identified by another user (claim 2);
- defining distinct groups of people and group event types appropriate for members of the groups (claim 3);
- identifying a digital media item as associated with a "high point" (claims 5 and 6);
- identifying the media type of a digital media item (claims 7 and 8);
- associating media items by receiving archiving input data associating multiple digital media items, then storing and retrieving media items based on such an association (claims 9-12); and
- performing "automatic nostalgic retrieval" of digital media items based on an initial selection by the user (claim 13).

The Examiner seemingly identifies random portions of Shneiderman, and asserts that those portions teach the subject matter of the dependent claims. In every case, the Examiner has misinterpreted either the subject matter of the claim or the disclosure of Shneiderman.

With respect to claim 2, the Examiner asserts that Shneiderman teaches the subject matter because "user log in with the system which identify the person in the library [sic] (fig 4)." Office Action of Dec. 12, 2005, p. 5. This rejection simply fails to address elements of the claim, specifically that the retrieval input data "comprises a user input **from another user**

identifying a group to which the **other user** belongs". As previously discussed, there is simply no indication that the system described in Shneiderman allows for interaction between **multiple** users in a group.

With respect to claim 3, the Examiner again cites to Figure 4 and asserts that "each of the photo being association with group of users in the photo [sic]," and thus Shneiderman teaches "defining the distinct groups of people, and defining group event types that are appropriate for members of the group to distinguish episodic events memorable to the group" as recited in claim 3. Office Action of Dec. 12, 2005, p. 5. Clearly, a photo of a group of people is "associated with" the people shown in the photo. However, this has no bearing on whether the people in the photo are users of the archival system, nor whether the "group" of people shown in the photo is in any way related to the "groups" defined in the archival system of the present invention. Furthermore, it is unclear how the Examiner believes that photographs define group event **types** as required by the claims.

Claims 5 and 6 are directed to the use of "high points" in archiving digital media items. As described in the present specification at page 4, designating a media item as comprising a "high point" allows a user to associate the media item with a "particularly memorable event." An example of such an event is a group's last day of school. *See* application, p. 12. In rejecting these claims, the Examiner asserted that archiving media items as high points is taught by Shneiderman because, in Figure 4, "time is the high point of the photo." Office Action of Dec. 12, 2005, p. 5. The Examiner further stated that retrieving archived media items is taught by Shneiderman because a user of the system described in Shneiderman can search "by names of people in each photo." *Id.* The Examiner misunderstands the present disclosure, the cited reference, or both. Associating a photograph with a specific time as taught in

Shneiderman is simply irrelevant to the concept of archiving a digital media item as a "particularly memorable event;" searching photographs based on the names of people in the photographs is similarly irrelevant to the concept of searching based on "high points." It is unclear what relationship, if any, the Examiner sees between the two types of activities.

Claims 7 and 8 relate to identifying the type of media item to be archived or retrieved. As described in the specification, digital media items can be of any type. Digital media items may be sound recordings, video clips, still photographs, etc. In contrast, the system disclosed in Shneiderman is used only to annotate digital *images*. The Examiner asserts that Shneiderman teaches identification of media type at col. 3, lines 4-8 and col. 1, lines 4-8. The only reference in Shneiderman to media "type" is that professional photographers may annotate photographs based on "film type." Shneiderman, p. 1. "Film type" refers to non-digital photographs (digital cameras do not use film); any photograph will have the same *media* type – namely, "image." Thus, there is no suggestion in Shneiderman that digital media items can be archived or retrieved based on their media type.

Regarding claims 9-12, the Examiner asserts that these claims are rendered obvious by the disclosure of Shneiderman that a photograph may be associated with people and dates, and that a set of photographs may be searched by person. See Office Action of Dec. 12, 2005, p. 6. However, claim 9, from which claims 10-12 depend directly or indirectly, recites "receiving archiving input identifying a **plurality** of digital media items and an input identifying the digital media items to be associated **as perceived by the user**". Hence, a user may select an arbitrary set of media items, and create an association based on the user's perception of those items. Shneiderman merely allows a user to annotate a photograph with names of people, places, objects, etc. *in the photograph*. There is no suggestion that a set of photographs may

be grouped together based on an arbitrary association. Again, the Examiner has misunderstood the claims, and incorrectly applied the cited art.

Claim 13 allows for nostalgic retrieval of digital media items via an automated process. As described in the present specification at pages 4-5, this process allows a user to specify an initial starting point, such as a time or event, and then follow a "trail" of media items that is determined by the changing selections of persons in the group, event types, and time periods. Similarly, the system may provide an initial, randomly selected set of media items, and then present further media items based on user input or on further random selections. The Examiner asserted that this claim was obvious over the disclosure of Shneiderman that stored photographs may be retrieved based on searching names of people in each photograph. *See* Office Action of Dec. 12, 2005, p. 7. It is unclear how this simple search-by-name functionality is related to the automated process recited in claim 13. The disclosure of Shneiderman requires a user to search stored photographs by a person's name. In contrast, the claimed method repeatedly presents a user with digital media items, without requiring initial user input. The disclosure of a simple search-by-name function does not render the complex, automated nostalgic retrieval process recited in claim 13 obvious.

As shown above, there is little or no relationship between the disclosure of Shneiderman and the elements recited in claims 2-13. As with claim 1, Applicants presented these differences during prosecution, but they were not directly addressed by the Examiner. The obviousness rejections are incorrect and should be reversed.

Claims 14-27

Independent claims 14, 15, and 17 are apparatus and method claims with limitations similar to those in claim 1. Specifically, these claims recite elements incorporating the following:

- "a group to which the user belongs" (claims 14 and 15);
- "selection of zero or more group event types from a predetermined plurality of group event types specific to the group" (claims 14, 15, and 17); and
- "selection of zero or more persons in the group" (claims 14, 15, and 17).

As described above with respect to claim 1, neither Shneiderman nor Mizoguchi teaches any application of user groups and group event types in archiving digital media items.

Similarly, dependent claims 16 and 18-27 were rejected by the Examiner on the same grounds as their corresponding method claims. As described previously with respect to the dependent method claims, Shneiderman and Mizoguchi do not teach or suggest the subject matter of these claims. In many instances, the references are not relevant to the subject matter. As with the previous claims, in response to Applicants' arguments the Examiner merely repeated the previous rejection without additional comment. *See* Office Action of Jan. 26, 2005, p. 3-7; Office Action of Dec. 12, 2005, p. 5-7. The rejection of claims 14-27 is incorrect, and should be reversed.

THE EXAMINER APPLIED AN IMPROPER STANDARD IN COMPARING THE CITED ART TO THE PRESENT INVENTION AND IGNORED MOTIVATION IN THE ART

In an interview conducted February 9, 2006, the Examiner maintained that the failure of the cited art to describe the use of groups is a minor omission. While Applicants respectfully disagree with the Examiner's characterization of the art, this point of view ignores the legal standard for obviousness. Under the proper standard, the Examiner was required to find prior art that disclosed all the elements of the claims, not just the "important" elements. M.P.E.P. §

2142. In addition the specification clearly explains that the use of group-based indexing and retrieval operations can provide significant benefits. *See* pp. 1-3 and throughout the specification. The claims fully meet the legal requirements for patentability.

In addition, the Examiner has not provided, nor is there, a motivation to combine Shneiderman, Mizoguchi, and/or Astle. To establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. Vaeck, 947 F.2d 488; MPEP § 2142-43. There is no motivation to combine the annotation system of Shneiderman with the video sequence indexing system of Astle. Astle discloses the use of time counters or index frames to index video sequences. Astle, col. 2, lines 11-25; col. 6, lines 3-50. A person of ordinary skill in the art would have no reason to adapt either indexing system to the annotation system of Shneiderman. Shneiderman already provides a means of recording the date of a photograph. Shneiderman, p. 4. The frame-based indexing system of Astle would have no meaning in indexing photographs as disclosed by Shneiderman, since each photograph is already a separate "frame."

Similarly, there is no motivation to combine the in-camera annotation system of Mizoguchi with the computer-based annotation system of Shneiderman. Neither reference indicates that it is desirable or possible to combine the disclosed annotation system with the system of the other. In fact, one of skill in the art would be unlikely to combine the disparate systems, since each uses different techniques, labels, and user interfaces for annotating figures. The system of Mizoguchi requires a scheduling/calendaring system to organize photographs,

while the system of Shneiderman allows for freetext input. *See* Mizoguchi, col. 5, lines 1-7; col. 8, lines 15-47; Shneiderman, p. 4. One of skill in the art would have no reason to combine the schedule-based system of Mizoguchi with the freetext annotation system of Shneiderman.

In each case, the Examiner has failed to point out where in the references or in the knowledge generally available to one of skill in the art there is a motivation to combine any of the cited references. The obviousness rejections of all the claims are incorrect, and must be reversed.

CONCLUSION

Applicant respectfully requests reversal of the obviousness rejection to claims 1-27 and 58-67. These claims are allowable over the cited art.

The Commissioner is authorized to charge the fee for this appeal brief of $250.00 (small entity) as set forth in 37 C.F.R. §41.20(b)(2) and all other fees associated with this submission to Deposit Account No. 11-0600.

Respectfully submitted,

Date: May 15, 2006

Robert L. Hails, Jr.
Registration No. 39,702

KENYON & KENYON LLP
1500 K Street, N.W.
Washington, D.C. 20005
Ph.: (202) 220-4200
Fax.: (202) 220-4201

CLAIMS APPENDIX

1. A method of archiving and retrieving digital media items, comprising

receiving a user input identifying a group of users to which an archiving user belongs;

receiving archiving input data identifying: a digital media item to be archived for the group, the user's selection of zero or more group event types from a predetermined plurality of group event types specific to the group, the user's selection of zero or more persons in the group, and the user's selection of a time period;

generating index information using the received user archiving input;

storing the index information in association with the identified digital media item;

repeating the reception of archiving input data, the generation of the index information and the storing of the index information for a plurality of digital media items;

receiving retrieval input data representing a selection of a default or zero or more group event types from the predetermined plurality of group event types for the group, a selection of a default or zero or more persons in the group, and a selection of a time period; and

using the selections and the identified group to retrieve and output digital media items that match the selection.

2. A method according to Claim 1 wherein the retrieval input data comprises a user input from another user identifying a group to which the other user belongs and the digital media items are retrieved using the group identified for the other user in the user retrieval input.

3. A method according to claim 1 including defining the distinct groups of people, and defining group event types that are appropriate for members of the groups to distinguish episodic events memorable to the group.

4. A method according to claim 1 including receiving said digital media item to be archived, and storing said digital media item in association with the index information.

5. A method according to claim 1 including receiving archiving input data identifying a digital media item as being associated with a memorable high point in the mind of the user.

6. A method according to claim 5 wherein the retrieval input data includes an input selecting memorable high points.

7. A method according to claim 1 wherein the index information includes an identification of a media type of the digital media item.

8. A method according to claim 7 wherein the retrieval input data includes an input identifying a media type, and the digital media items are retrieved and output based on the identified media type.

9. A method according to claim 1 including receiving archiving input data identifying a plurality of digital media items and an input identifying the digital media items to be associated as perceived by the user, wherein the index information is generated to include the identified association.

10. A method according to claim 9 wherein, when digital media items are retrieved and output as a result of the user retrieval input, any digital media items having the identified association in the index information are automatically identified for retrieval and output.

11. A method according to claim 10 wherein the automatically identified digital media items are automatically retrieved and output.

12. A method according to claim 10 including outputting a notification to a user that associated digital media items are available, and retrieving and outputting automatically identified digital media items in response to a user input.

13. A method according to claim 1 further comprising:

receiving a user request for automatic nostalgic retrieval,

automatically generating an initial set of said selections,

using the selections to retrieve and output digital media items,

automatically modifying one or more of the selections,

using the modified selections to retrieve and output digital media items and

repeating the modifying, and retrieval and output steps.

14. A user terminal for use in the archiving and retrieval of digital media items associated with predefined distinct groups of one or more people, the terminal comprising:

user interface means for generating archiving input data identifying:

a group to which the user belongs,

a digital media item to be archived for the group,

a user selection of zero or more group event types from a predetermined plurality of group event types specific to the group,

a user selection of zero or more persons in the group, and

a user selection of a time period;

transmission means for transmitting the archiving input to a processing device for generating index information using the archiving input and for storing the index information in association with the identified item;

wherein said user interface means further is for generating retrieval input data identifying:

a group to which a retrieving user belongs,

a retrieving user's selection of a default or zero or more group event types from the predetermined plurality of group event types for the group,

a retrieving user's selection of a default or zero or more persons in the group,

a retrieving user's selection of a time period; and

said transmission means is adapted to transmit the retrieval input to the processing device to identify digital media items using the retrieval input;

the user terminal further including

receiving means for receiving any digital media items identified by the processing device; and

a display for displaying the received digital media items.

15. A method of operating a terminal for use in the archiving and retrieval of digital media items for predefined distinct groups of people, the method comprising:

receiving from an archiving user archiving input data identifying:

a group to which the user belongs,

a digital media item to be archived for the group,

a selection of zero or more group event types from a predetermined plurality of group event types specific to the group,

a selection of zero or more persons in the group, and

a selection of a time period;

transmitting the archiving input to a processing device for generating index information using the archiving input and for storing the index information in association with the identified item;

receiving from a retrieving user retrieval input data identifying:

a group to which the user belongs,

a selection of default or zero or more group event types from the predetermined plurality of group event types for the group,

a selection of default or zero or more persons in the group, and

a selection of a time period;

transmitting the retrieval input to the processing device to identify digital media items using the retrieval input;

receiving any digital media items identified by the processing device; and

displaying the received digital media items.

16. A carrier medium storing processor readable and implementable code for controlling a processor to carry out the method of any one of claims 1 to 13 or 15.

17. Apparatus for archiving and retrieving digital media items for predefined distinct groups of one or more people, the apparatus comprising:

receiving means for receiving archiving input data identifying a group to which the user belongs, the archiving input data identifying:

a digital media item to be archived for the group,

a selection of zero or more group event types from a predetermined plurality of group event types specific to the group,

a selection of zero or more persons in the group, and

a selection of a time period;

generating means for generating index information using the received user archiving input;

storing means for storing the index information in association with the identified digital media item;

wherein said receiving means is adapted to receive retrieval input data identifying a manual or automatic selection of zero or more group event types from the predetermined plurality of group event types for the group, a selection of zero or more persons in the group, and a selection of a time or time period; and

the apparatus further includes retrieval means for using the selections and the identified group to retrieve and output digital media items that match the selections.

18. Apparatus according to claim 17 wherein said receiving means is adapted to receive the retrieval input data from another user, said retrieval input data identifying a group to which the other user belongs.

19. Apparatus according to claim 17 including means for defining the distinct groups of people, and for defining group event types that are appropriate for members of the groups to distinguish episodic events memorable to the group.

20. Apparatus according to claim 17 wherein said receiving means is adapted to receive said digital media items to be archived, and item storing means for storing said digital media item in association with the index information.

21. Apparatus according to claim 17 wherein said receiving means is adapted to receive archiving input data identifying a digital media item as being associated with a memorable high point in the mind of the user.

22. Apparatus according to claim 21 wherein said receiving means is adapted to receive retrieval input data selecting memorable high points.

23. Apparatus according to claim 17 wherein said generating means is adapted to include an identification of a media type of the digital media item.

24. Apparatus according to claim 23 wherein said receiving means is adapted to receive retrieval input data identifying a media type, and said retrieval means is adapted to retrieve and output digital media items based on the identified media type.

25. Apparatus according to claim 17 wherein said receiving means is adapted to receive archiving input data identifying a plurality of digital media items to be sequenced as perceived by the user, and said generating means is adapted to generate the index information to include the identified sequences.

26. Apparatus according to claim 25 wherein said retrieval means is adapted to retrieve all digital media items identified to be sequenced when one or more digital media items are selected for retrieval.

27. Apparatus according to claim 17 wherein said receiving means receives a request for automatic nostalgic retrieval, said generating means is adapted to generate an initial set of selections and automatically modify one or more of the selections at a time in response to the

request, said retrieval means is adapted to sequentially output digital media items retrieved using the generated and modified sets of selection.

28-57. (cancelled)

58. A media archival method, comprising, under control of an operator who is a member of a group:

authenticating an operator as a member of a group of users,

identifying candidate identification values based upon the group with whom the operator is authenticated,

querying the operator for selection of identification data to be associated with a digital media item, the query identifying the candidate identification values and including valid selections of an event type and persons from the group and time,

generating index information from a response of the operator, and

storing the index information in association with the digital media item.

59. The archival method of claim 58, wherein the candidate identification values for persons include names of group members.

60. The archival method of claim 58, wherein the stored index information includes a flag that distinguishes high point items from other items, and the method further comprises setting the flag if the operator response includes an indication that the digital media item is a high point.

61. The archival method of claim 58, wherein, if the operator response indicates that the digital media item is a member of a trail, the index information includes an identifier representing the media item's display position in a sequence of stored media items stored by the system.

62. A multimedia retrieval method, comprising, under control of an operator who is a member of a group:

authenticating an operator as a member of a group of users,

identifying candidate identification values based upon the group with whom the operator is authenticated,

querying the operator for selection of identification data, the query identifying the candidate identification values and including valid selections of an event type and persons from the group and time,

generating index information from a response of the operator, and

retrieving stored media items corresponding to the index information.

63. The retrieval method of claim 62, wherein the candidate identification values for persons include names of group members.

64. The retrieval method of claim 62, wherein the stored index information includes a flag that distinguishes high point items from other items, and the method further comprises searching for the flag among the stored index information if the operator response includes an indication that high point items are selected.

65. The retrieval method of claim 62, further comprising, if the operator response indicates that a trail is selected, presenting stored media items in a sequence as identified in the index information corresponding to the presented media items.

66. A method of archiving digital media items, comprising:

receiving a user input identifying a social group to which an archiving user belongs;

building a database that includes:

digital media items to be archived for the social group, and

index information for the digital media items, each instance of index information created from archiving input data identifying a user's response to a query that identifies a plurality of event types previously registered as associated with the social group, and persons previously registered as members of the social group.

67. A method of searching digital media items, comprising:

receiving a user input identifying a social group for which a search is to be conducted;

identifying candidate identification values based upon the social group,

displaying a query that identifies the candidate identification values and including valid selections of an event type for the social group, persons from the social group and time,

responsive to selection criteria made in response to the query, searching a database and retrieving digital media items that satisfy the selection criteria.

EVIDENCE APPENDIX

The following items were made of record and have been relied on by the Examiner in making the appealed rejections:

Shneiderman, et al., "Direct Annotation: A Drag-and-Drop Strategy for Labeling Photos," Proc. International Conference Information Visualizaion (IV2000), London, England.

Mizoguchi, Yoshiyuki, "Information Processing Method and Apparatus Therefore," E.P. Application No. 0 678 816 A2, Oct. 25, 1995.

Astle, Brian, "Video Database Indexing and Method of Presenting Video Database Index to a User," U.S. Patent No. 5,485,611, Jan. 16, 1996.

RELATED PROCEEDINGS APPENDIX

None.

Direct Annotation: A Drag-and-Drop Strategy for Labeling Photos

Ben Shneiderman, Hyunmo Kang
Dept. of Computer Science, Human-Computer Interaction Laboratory,
Institute for Advanced Computer Studies & Institute for Systems Research
University of Maryland, College Park, MD 20742 USA
{ben, kang}@cs.umd.edu

Abstract

Annotating photos is such a time-consuming, tedious and error-prone data entry task that it discourages most owners of personal photo libraries. By allowing users to drag labels such as personal names from a scrolling list and drop them on a photo, we believe we can make the task faster, easier and more appealing. Since the names are entered in a database, searching for all photos of a friend or family member is dramatically simplified. We describe the user interface design and the database schema to support direct annotation, as implemented in our PhotoFinder prototype.

Keywords: direct annotation, direct manipulation, graphical user interfaces, photo libraries, drag-and-drop, label placement

1. Introduction

Adding captions to photos is a time-consuming and error prone task for professional photographers, editors, librarians, curators, scholars, and amateur photographers. In many professional applications, photos are worthless unless they are accurately described by date, time, location, photographer, title, recognizable people, etc. Additional annotation may include details about the photo (for example, film type, print size, aperture, shutter speed, owner, copyright information) and its contents (keywords from controlled vocabularies, topics from a hierarchy, free text descriptions, etc.). For amateur photographers, annotations are rarely done, except for the occasional handwritten note on the back of a photo or an envelope containing a collection of photos.

For those who are serious about adding annotations, the common computer-based approach is to use database programs, such as Microsoft Access, that offer form fill-in or free text boxes and then store the information in a database. Data entry is typically done by typing, but selecting attribute values for some fields (for example, black&white or color film) is supported in many systems. Of course, simpler tools that provide free-form input, such as word processors, spreadsheets, and other tools are used in many situations. Captions and annotations are often displayed near a photo on screen displays, web pages, and printed versions. Software packages (Kodak PhotoEasy, MGI PhotoSuite, Aladdin Image AXS, etc.) and web sites (Kodak's photonet, Gatherround.com, shutterfly, etc.) offer modest facilities to typing in annotations and searching descriptions.

As photo library sizes increase the need and benefit of annotation and search capabilities grows. The need to rapidly locate photos of Bill Clinton meeting with Boris Yeltsin at a European summit held in 1998 is strong enough to justify substantial efforts in many news agencies. More difficult searches such as "agriculture in developing nations" are harder to satisfy, but many web and database search tools support such searches (Lycos, Corbis, etc.). Query-By-Image-Content from IBM, is one of many projects that uses automated techniques to analyze image (http://wwwqbic.almaden.ibm.com/). Computer vision techniques can be helpful in finding photos by color (sunsets are a typical example), identifying features (corporate logos or the Washington Monument), or textures (such as clouds or trees), but a blend of automated and manual techniques may be preferable. Face recognition research offers hope for automated annotation, but commercial progress is slow [1][2].

2. Related Work on Annotation

Annotation of photos is a variation on previously explored problems such as annotation on maps [3][4][5] in which the challenge is to place city, state, river, or lake labels close to the features. There is a long history of work on this problem, but new possibilities emerge because of the dynamics of the computer screen (Figure 1). However, annotation is usually seen as an authoring process conducted by specialists and users only chose

whether to show or hide annotations. Variations on annotation also come from the placement of labels on markers in information visualization tasks such as in tree structures, such in the hyperbolic tree [6] (Figure 2) or in medical histories, such as LifeLines [7] (Figure 3).

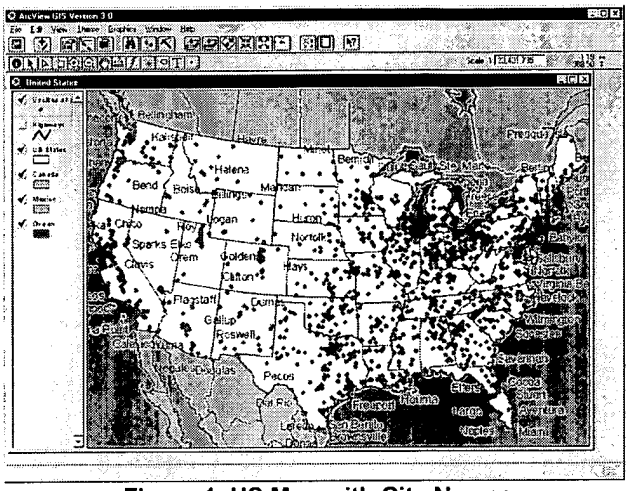


Figure 1. US Map with City Names

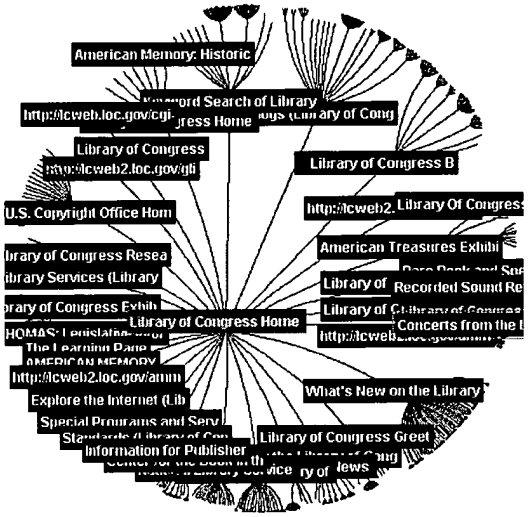


Figure 2. Hyperbolic Tree

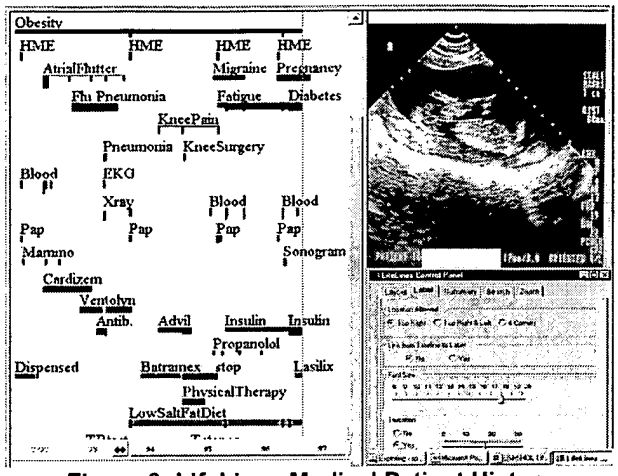


Figure 3. LifeLines Medical Patient History

Previous work on annotation focused on writing programs to make label placements that reduced overlaps [8], but there are many situations in which it is helpful for users to place labels manually, much like post-it notes, on documents, photos, maps, diagrams, webpages, etc. Annotation of paper and electronic documents by hand is also a much-studied topic with continuing innovations [9]. While many systems allow notes to be placed on a document or object, the demands of annotating personal photo libraries are worthy of special study [10]. We believe that personal photo libraries are a special case because users are concentrating on the photos (and may have a low interested in the underlying technology), are concerned about the social aspects of sharing photos, and are intermittent users. They seek enjoyment and have little patience for form filling or data entry.

3. The PhotoFinder Project

In the initial stages of our project on storage and retrieval from personal photo libraries (http://www.cs.umd.edu/hcil/photolib/), we emphasize collection management and annotation to support searching for people. This decision was based on our user needs assessment, reports from other researchers, and our personal experience that indicate that people often want to find photos of a friend or relative at some event that occurred recently or years ago [2][11]. Personal photo libraries may have from hundreds to tens of thousands of photos, and organization is, to be generous, haphazard. Photos are sometimes in neat albums, but more often put in a drawer or a shoebox. While recent photos are often on top, shuffling through the photos often leaves them disorganized. Some users will keep photos in the envelopes they got from the photo store, and more organized types will label and order them.

As digital cameras become widespread, users have had to improvise organization strategies using hierarchical directory structures, and typing in descriptive file and directory names to replace the automatically generated photo file numbers. Some software packages (PhotoSuite, PhotoEasy, etc.) enable users to organize photos into albums and create web pages with photos, but annotation is often impossible or made difficult. Web sites such as Kodak's PhotoNet.com, Gatherround.com, etc. enable users to store collections of photos and have discussion groups about the collections, but annotation is limited to typing into a caption field. The pioneering effort of the FotoFile [2] offered an excellent prototype that inspired our work.

Our goal in the PhotoFinder project was to support personal photo library users. We developed a conceptual model of a library having a set of collections, with each collection having a set of photos. Photos can participate in multiple collections. Collections and individual photos can be annotated with free text fields plus date and location fields stored in a database (see Figure 6 for our Photo Library database schema). Our interface has three main windows:

- **Library viewer**: Shows a representative photo for each collection, with a stack representing the number of photos in each collection.
- **Collection viewer**: Shows thumbnails of all photos in the collection. Users can move the photos around, enlarge them all or individually, cluster them, or present them in a compact manner. A variety of thumbnail designs were prototyped and will be refined for inclusion in future versions.
- **Photo viewer**: Shows an individual photo in a resizable window. A group of photos can be selected in the Collection viewer and dragged to the Photo viewer to produce an animated slide show.

We also put a strong emphasis on recording and searching by the names of people in each photo. We believed that a personal photo library might contain repeated images of the same people at different events, and estimated 100-200 identifiable people in 10,000 photos. Furthermore we expected a highly skewed distribution with immediate family members and close friends appearing very frequently. The many-to-many relationship between photos and people is mediated by the Appearance relation (Figure 6) that stores the identification of all the people who appear in each photo.

Such a database would support accurate storage of information, but we recognized that the tedious data entry problem would prevent most users from typing in names for each photo. Furthermore, the inconsistency in names is quickly a problem with misspellings or variant names (for example, Bill, Billy, William) undermining the success of search.

A second challenge we faced was that the list of names of people appearing in a photo could often be difficult to associate with individuals, especially in group shots. Textual captions often indicate left-to-right ordering in front and back rows, or give even more specific identification of who is where.

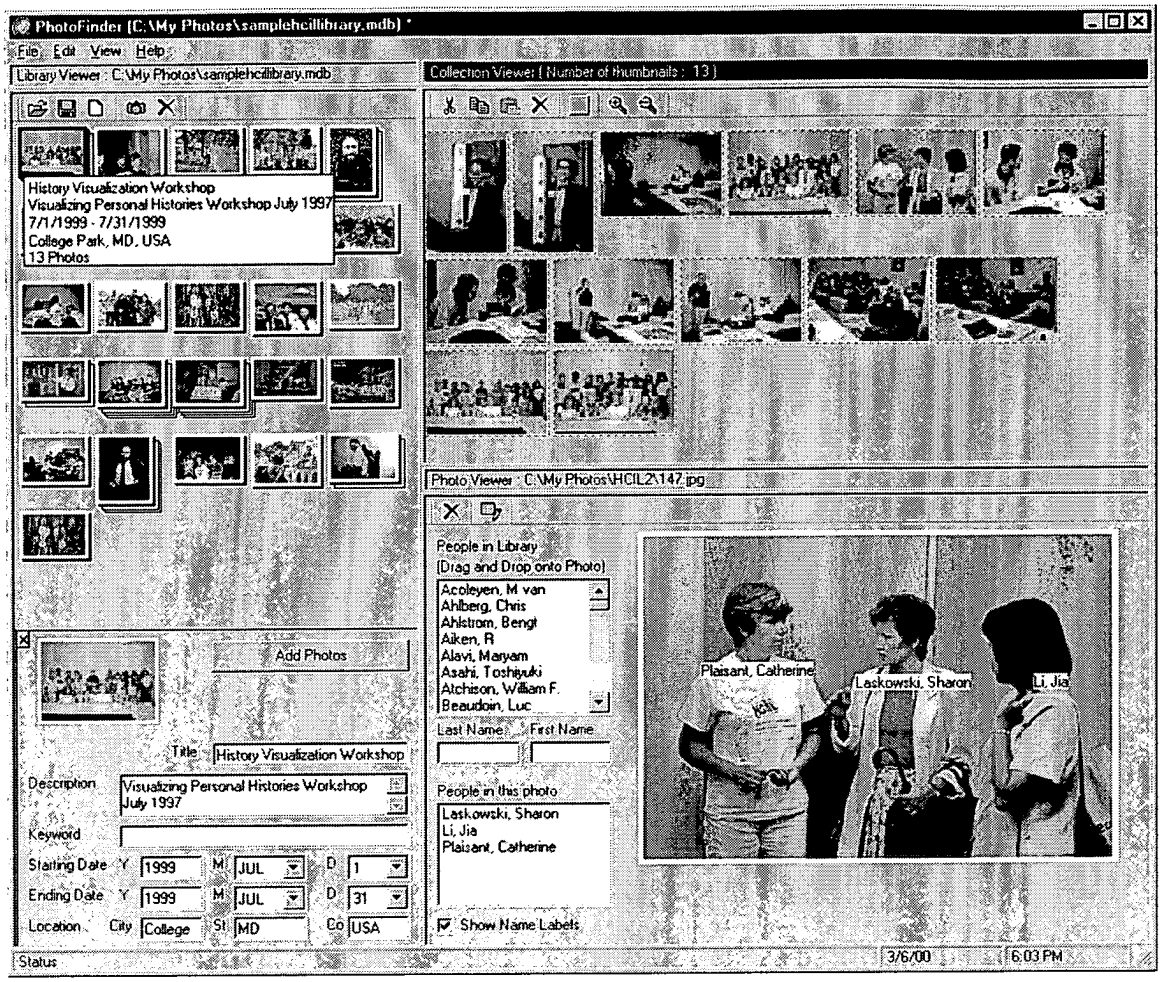


Figure 4. PhotoFinder1 display with Library Viewer on the left, Collection Viewer with thumbnails on the upper right, and Photo Viewer on the lower right.

4. Direct Annotation

To cope with these challenges we developed the concept of direct annotation: selectable, dragable labels that can be placed directly on the photo. Users can select from a scrolling or pop-up list and drag by mouse or touch screen. This applies direct manipulation principles [12] that avoid the use of a keyboard, except to enter a name the first time it appears. The name labels can be moved or hidden, and their presence is recorded in the database in the Appearance relation with an X-Y location, based on an origin in the upper left hand corner of the photo.

This simple rapid process also allows users to annotate at will. They can add annotations when they first see their photos on the screen, when they review them and make selections, or when they are showing them to others. This easy design and continuous annotation facility may encourage users to do more annotation. Figures 5 (a)-(f) show the process of annotation on a set of four people at a conference.

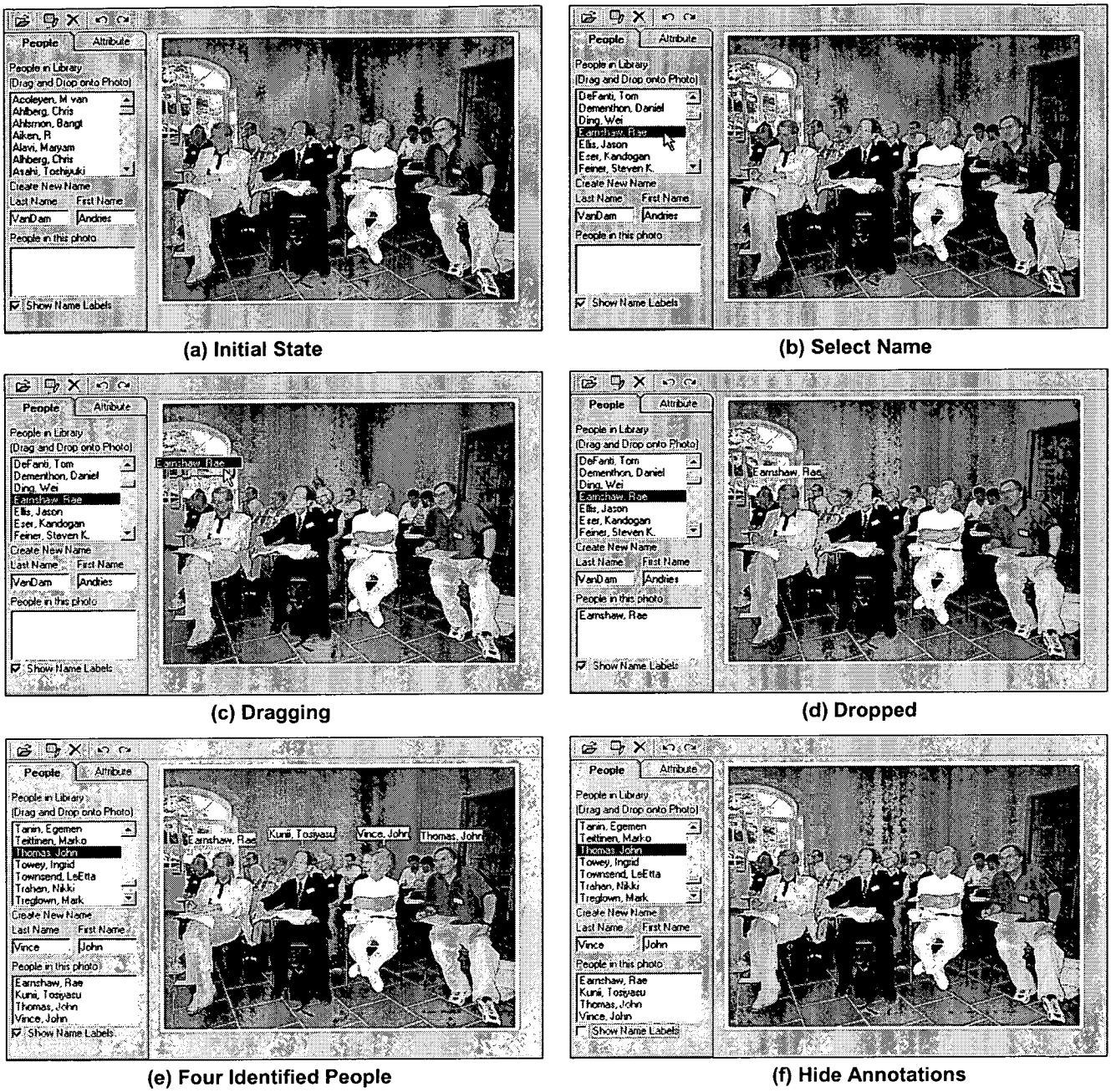


Figure 5. The Process of Dragging and Dropping an Annotation on a Photo

The selection list is shown as being an alphabetically organized scrolling menu, but it could be implemented as a split menu [13]. This would entail having 3-5 of the most commonly occurring names in a box, followed by the alphabetical presentation of the full list. Thus the most frequent names would be always visible to allow rapid selection. Name completion strategies for rapid table navigation would be useful in this application. When users mouse down on a name, the dragging begins and a colored box surrounds the name. When users mouse up, the name label is fixed in place, a tone is sounded, and the database entry of the XY coordinates is stored. The tone gives further feedback and reinforces the sense of accomplishment. Further reinforcement for annotation is given by subtly changing the border of photos in the Collection viewer. When a photo gets an annotation, its thumbnail's white border changes to green. Users will then be able to see how much they have accomplished and which photos are still in need of annotation.

A Show/Hide checkbox gives users control over seeing the photo with and without the name labels. Since the photo viewer window is resizable, the position of the labels changes to make sure they remain over the same

person. A small marker (ten pixels long) hangs down from the center of the label to allow precise placement when there are many people close together. The marker can be used to point at the head or body and it becomes especially useful in crowded group photos.

Future additions might include the capacity to resize the labels, change fonts, change colors, or add animations. Another interesting issue is collaborative annotation in which multiple users working side-by-side [14] or independently might annotate photos and then the results could be combined, with appropriate resolution of conflicts. Tools for finding variant spellings or switches between last and first names would help raise data quality. A valuable accelerator is bulk annotation [2], in which a group of photos is selected and then the same label is applied to every photo with one action, although individual placement might still be needed.

Of course, annotation by names of people in photos is only the first step. Drag and drop annotation for any kind of object in a photo (car, house, bicycle), map (cities, states, lakes), or painting (brushstroke, signature, feature) is possible. Annotation about the overall image, such as type of photo (portrait, group, landscape), map (highway, topographic, urban), or painting (impressionist, abstract, portrait) is possible. Colored ribbons or multiple star icons could be used to indicate the importance or quality of photos.

Searching and browsing become more effective once annotations are included in the photo database. The obvious task is to see all photos that include an individual. This has been implemented by simply dragging the name from the list into the Collection viewer or to a designated label area. The PhotoFinder finds and displays all photos in which that name appears in a label.

5. Database Design and Implementation

5.1 Schema of the Photo Library database

The PhotoFinder operates using a Photo Library database (Microsoft Access), which contains five linked tables (Figure 6). The basic concept is that a Photo Library contains Collections of Photos, and that Photos contain images of People.

In the Photo Library schema, the Collections table represents the collections of photos with attributes such as Collection Title, Description, Keywords, Starting Date, Ending Date, Location, Representative PhotoID and unique Collection ID. The Photos table is where references (full path and file name) of photos and their thumbnails are stored with important attributes such as the date of photo, event, keywords, location, rating, color, locale, and so on. Each photo should have a unique reference and photos with the same references are not allowed to be stored in this table even though they have different attribute values. The Linkage table is the connection between the Collections table and Photos table. It stores the links between collections and photos.

The People table stores all the information about the people who appear in the Photo Library. In our initial implementation, attributes include only the Given (First) name and Family (Last) name of the person, and the unique PersonID (people with the same first and last name are not allowed to be stored in People table). Eventually, the People table will be extended to include personal information such as e-mail address for exporting the Photo Library, homepage address, occupation and so on. The Appearance table stores the information about which Person is in which Photo. It serves as the linkage between the Photos table and the People table. Attributes include AppearanceID, PersonID, PhotoID, and relative (X, Y) coordinates (upper left corner is (0,0), lower right is (100,100)) of people in the photos.

In designing the Photo Library, we made three major assumptions concerning the Library, Collections, and Photos. These assumptions can be classified as follows:

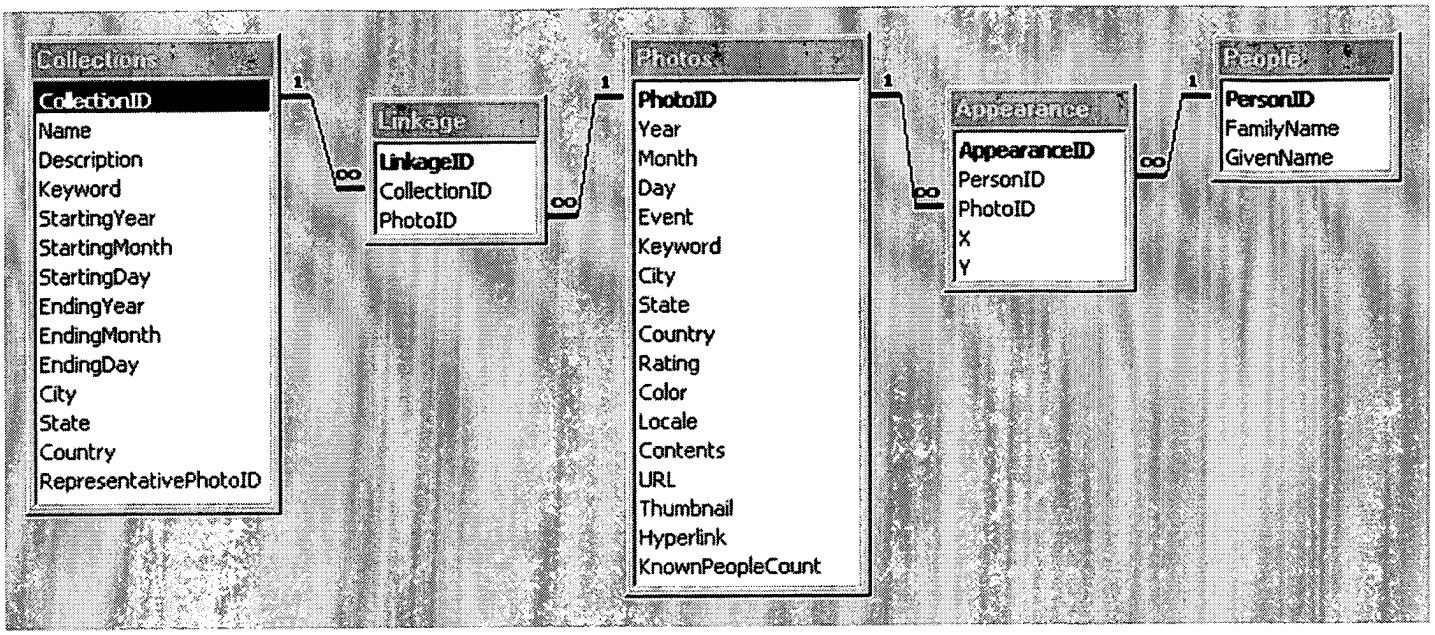


Figure 6. The schema of Photo Library database

- *Relationship between Collections and Photos*

A 1-to-many relationship between the Collections table and the Linkage table has been set so that a collection can contain multiple photos, and a 1-to-many relationship between the Photos table and the Linkage table has been set so that same photo can be included in multiple collections. It is also possible that a collection contains the same photo multiple times to permit reappearances in a slide presentation. Two different collections could have exactly same set of photos. If two photos have different path names, they are different photos even though they are copies of a photo.

- *Relationship between Photos and People*

A 1-to-many relationship between the Photos table and the Appearance table has been set so that a photo can contain multiple persons, and a 1-to-many relationship between People table and Appearance table has been set so that same person can be included in multiple photos. Multiple appearances of the same person in a photo are not allowed. A composite pair of Given name and Family name should be unique in the People table.

- *Relationship among Library, Collections, and Photos*

Within a library, the same photo could be contained in multiple collections multiple times, but their attributes and annotations must be the same.

In the first design of the Photo Library database, we only considered annotation by names of people in photos, but the Photo Library database can be easily extended by adding an Object table, Animal table, Keyword table, and so on, along with connection tables similar to the Appearance table. With such a Photo Library database design, more flexible annotation would be possible.

5.2 Updating the Photo Library Database by Direct Annotation

PhotoFinder keeps updating the Photo Library database whenever the direct annotation module causes any information changes. In this section, we classify the Photo Library database updating situations into five categories, and discuss corresponding algorithm and implementation issues.

- *Adding a New Name Label / Creating a New Person:*

When users drag a name from "People in Library" listbox and drop it onto a photo, PhotoFinder immediately checks whether there already exists an Appearance connection between the photo and the person since multiple appearances of the same person in a photo are not allowed. If a conflict occurs, PhotoFinder would highlight the existing name label on the photo and ignore the drag-and-drop event with a warning message. If there is no conflict, PhotoFinder finds the PersonID and PhotoID, calculates a relative (X, Y) position ($0 \leq X, Y$

≤100) of the drag-and-drop point on the photo, and then creates a new Appearance record with this information. After adding a new record to the Appearance table, the PhotoFinder updates "People in this Photo" listbox and finally creates a name label on the photo. To show that the label has just been inserted, the newly added name in the "People in this Photo" listbox will be selected, and accordingly the new name label on the photo will be highlighted. If the added name label is the first one on the photo, PhotoFinder sends an event to the Collection Viewer to change the border color of the corresponding thumbnail to green, in order to show that the photo now has an annotation. The algorithm for creating a new person is simple. As soon as users type in the first name and last name of a person in the editbox and press enter, PhotoFinder checks whether the name already exists in the People table. If so, a warning message will be displayed with the name in "People in Library" listbox being selected. If not, PhotoFinder creates and adds a new Person record to the People table, and then updates the "People in Library" listbox, selecting and highlighting the newly added name.

- *Deleting Name Label / Deleting Person:*

When the delete button of the Photo Viewer toolbar is clicked or the delete key is pressed, PhotoFinder checks whether the selected name label already exists. If not, PhotoFinder ignores the deleting action. But if it exists, PhotoFinder automatically calculates the PersonID of the selected name label and the PhotoID, and it searches through the Appearance table to find and delete an Appearance record having those IDs. PhotoFinder updates "People in this Photo" listbox and deletes the name label on the photo. If the deleted name label was the last one on the photo, PhotoFinder sends an event to the Collection Viewer to change the border color of the corresponding thumbnail to white, to show that the photo has no annotation. If focus is on the "People in Library" listbox and the delete key is pressed, PhotoFinder finds the PersonID of the selected name in the listbox. PhotoFinder deletes the PersonID from the People table and also deletes all the Appearance records containing that PersonID, which results in the complete elimination of the name label from the other photos in the Photo Library. Again, Collection Viewer updates the border color of thumbnails that no longer have annotations.

- *Editing a Name of Person:*

Users can edit a name of person in library by pressing the edit button of the Photo Viewer toolbar or by just double clicking over the selected name in the "People in Library" listbox. When the edited name is typed in, PhotoFinder finds and changes the corresponding person record from the People table only if there is no duplication of the name in the People table. It also refreshes both the "People in this Photo" and the "People in Library" listboxes, and all the name labels on the current photo. If duplication occurs, the whole editing process will be ignored with a warning message.

- *Positioning Name Label:*

Drag-and-dropping the existing label over the photo can change position of the name label. As mentioned before, the relative (X, Y) position of the center point of a name label is stored in the corresponding Appearance record. PhotoFinder uses a small marker hanging down from the center of the label to allow precise placement. But since the size and direction (downward) of the marker is fixed, it is somewhat difficult to distinguish labels when many people appear in the photo close together. Using Excentric labels [15] or adding an additional (X, Y) field to the Appearance table to allow a longer and directional marker could solve this problem. Other features such as changing the font size of labels and avoiding occlusion among labels in resizing the photo will be handled in future versions of PhotoFinder.

- *Importing People Table from other Libraries:*

Retyping the names that already exist in other libraries is very tedious and time-consuming job. Therefore, PhotoFinder supports a function to import the People table from other libraries. The internal process of importing the People table is similar to that of creating a new person repeatedly. The only thing PhotoFinder should handle is checking and eliminating the duplication of a person name.

6. Conclusion

Digital photography is growing rapidly, and with it the need to organize, manage, annotate, browse and search growing libraries of photos. While numerous tools offer collection or album management, we believe that the addition of easy to use and enjoyable annotation techniques is an important contribution. After a single demonstration, most users understand direct annotation and are eager to use it. We are adding features, integrating search functions, and conducting usability tests.

Acknowledgements: We appreciate the partial support of Intel and Microsoft, and the contributions of Ben Bederson, Todd Carlough, Manav Kher, Catherine Plaisant, and other members of the Human-Computer Interaction Laboratory at the University of Maryland.

7. REFERENCES

[1] R. Chellappa, C.L. Wilson and S. Sirohey, "Human and Machine Recognition of Faces: A Survey" *Proceedings of the IEEE*, Vol. 83, pp. 705-740, May 1995.

[2] Allan Kuchinsky, Celine Pering, Michael L. Creech, Dennis Freeze, Bill Serra, Jacek Gwizdka, "FotoFile: A Consumer Multimedia Organization and Retrieval System", *Proceedings of ACM CHI99 Conference on Human Factors in Computing Systems*, 496-503, 1999.

[3] E. Imhof, "Positioning Names on Maps", *The American Cartographer*, 2, 128-144, 1975.

[4] J. Christensen, J. Marks, and S. Shieber, "An Empirical Study Of Algorithms For Point-Feature Label Placement", *ACM Transactions on Graphics 14*, 3, 203-232, 1995.

[5] J. S. Doerschler and H. Freeman, "A Rule-Based System For Dense-Map Name Placement", *Communications Of The ACM* 35, 1, 68-79, 1992.

[6] John Lamping, Ramana Rao, and Peter Pirolli, "A Focus + Context Technique Based On Hyperbolic Geometry For Visualizing Large Hierarchies", *Proceedings of ACM CHI95 Conference on Human Factors in Computing Systems*, New York, 401-408, 1995.

[7] Jia Li., Catherine Plaisant, Ben Shneiderman, "Data Object and Label Placement for Information Abundant Visualizations" *Workshop on New Paradigms in Information Visualization and Manipulation (NPIV'98)*, ACM, New York, 41-48, 1998.

[8] Mark D. Pritt, "Method and Apparatus for The Placement of Annotations on A Display without Overlap", US Patent 5689717, 1997.

[9] Bill N. Schilit, Gene Golovchinsky, and Morgan N. Price, "Beyond Paper: Supporting Active Reading with Free Form Digital Ink Annotations", *Proceedings of ACM CHI 98 Conference on Human Factors in Computing Systems*, v.1 249-256, 1998.

[10] J Kelly Lee and Dana Whitney Wolcott, "Method of Customer Photoprint Annotation", US Patent 5757466, 1998.

[11] Richard Chalfen, *Snapshot Versions of Life*, Bowling Green State University Popular Press, Ohio, 1987.

[12] Ben Shneiderman, *Designing the User Interface: Strategies for Effective Human-Computer Interaction, 3rd Edition*, Addison Wesley Longman, Reading, MA, 1998.

[13] Andrew Sears and Ben Shneiderman, "Split Menus: Effectively Using Selection Frequency To Organize Menus", *ACM Transactions on Computer-Human Interaction 1*, 1, 27-51, 1994.

[14] J. Stewart, B. B. Bederson, & A. Druin, "Single Display Groupware: A Model for Co-Present Collaboration.", *Proceedings of ACM CHI99 Conference on Human Factors in Computing Systems*, 286-293, 1999.

[15] Jean-Daniel Fekete Catherine Plaisant, "Excentric Labeling: Dynamic Neighborhood Labeling for Data Visualization.", *Proceedings of ACM CHI99 Conference on Human Factors in Computing Systems*, 512-519, 1999.

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO.	:	5,485,611
DATED	:	January 16, 1996
INVENTOR(S)	:	Brian Astle

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Title page, second column, *Attorney, Agent or Firm*, delete "Stephen" and insert therefor --Stephan--.

Signed and Sealed this

Fourteenth Day of May, 1996

Attest:

BRUCE LEHMAN

Attesting Officer

Commissioner of Patents and Trademarks

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number : **0 678 816 A2**

(12) EUROPEAN PATENT APPLICATION

(21) Application number : **95302597.0**

(51) Int. Cl.[6] : **G06F 17/30**

(22) Date of filing : **19.04.95**

(30) Priority : **21.04.94 JP 82979/94**
07.10.94 JP 270343/94

(43) Date of publication of application :
25.10.95 Bulletin 95/43

(84) Designated Contracting States :
DE ES FR GB IT NL

(71) Applicant : **CANON KABUSHIKI KAISHA**
30-2, 3-chome, Shimomaruko,
Ohta-ku
Tokyo (JP)

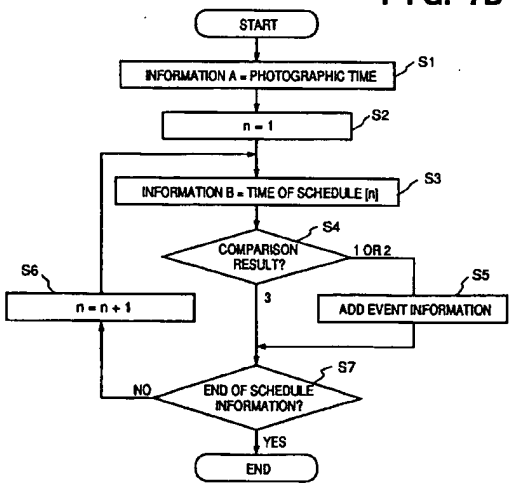
(72) Inventor : **Mizoguchi, Yoshiyuki, c/o Canon K.K.**
30-2, 3-chome, Shimomaruko
Ohta-ku, Tokyo (JP)

(74) Representative : **Beresford, Keith Denis Lewis et al**
BERESFORD & Co.
2-5 Warwick Court
High Holborn
London WC1R 5DJ (GB)

(54) Information processing method and apparatus therefor.

(57) Disclosed is an information processing method of generating image data and additional data paired with the image data and capable of searching image data at high speed. Photographic time at which image data is photographed is compared with a predetermined time range (S1, S2, S3, S4). Event information corresponding to the predetermined time range in which its photographic time is included is added to the image data (S5) and stored. An image data search operation is performed on the basis of the stored event information.

FIG. 7B



EP 0 678 816 A2

The present invention relates to an information processing method of recording and reproducing electronic information and an apparatus therefor.

In conventional photography using a silver salt film, along with developments of camera techniques including automatic focus control (AF) and automatic exposure control (AE), a photograph intended by a photographer has been able to be taken with an easy operation. To search a desired photograph from the photographs taken by the photographer, it is important that the photographs taken by the photographer are properly filed so as to determine easy access to the desired photograph. This filing entirely depends on the efforts of the photographer.

More specifically, even if there are a large number of excellent photographs which reflect the will of the photographer, improper filing may hoard these photographs. No drastic countermeasures for filing photographs have been made in the conventional photographic system using silver salt films, except for a simple countermeasure such as date imprinting. For this reason, the photographer must file his photographs in an album or the like and record the contents of the photographs, resulting in cumbersome operations.

No system improvement has been made to solve the above problem even in an electronic still camera for recording a photograph as an electrical signal on a floppy disk. Information added to image information includes the date, the serial number, and the like. For this reason, the photographic contents must be described in the recorded floppy disk and managed. These data added to the image information are superposed on analog signals serving as image data. To rewrite these data or add new data, the image data itself must also be rewritten to require a large circuit size. In addition, it is impossible to access these data in a search mode. It is, therefore, difficult to perform a high-speed search operation.

In recent years, an electronic still camera for recording a photograph as a digital signal in a memory card is proposed and put into practical use. In this still camera, data for searching a photographed image can be added easier than in the conventional system. An embodiment disclosed in Japanese Patent Laid-Open No. 4-70735 proposes a method of managing and searching image data.

In this method, any one of a photographic date, a photographic place, weather, a name of person, a portrait, an event, and audio data is recorded as image search data together with image data. The image search data can be input together with the image data automatically or by the photographer upon completion of photography. Subsequently, a data type (search key) is designated. When this data is input, an image having data whose contents are identical to those of the input data is searched. For example, if a person is designated and "Yoshida" is input, an image having portrait data representing a person "Yoshida" is searched and output. If time is designated, and a specific moment is input, an image having the specific moment as the data is searched and output.

In consideration of personal use, the most effective search key of the above search keys in the search mode is the event key representing that a photograph is taken in a "field day", a "golf course", or the like. No general method of inputting event data is described in the above prior art. As a special case, there is described a method of transmitting the above data in only a limited case by means of an electric wave and causing a camera to receive and automatically record the electric wave as image data. In this case, the application range of the camera is undesirably limited.

The present invention has been made in view of the conventional problems described above, and has as one object to provide an information equipment, capable of filing photographed images during photography, recording management data, and efficiently searching a photographed image.

According to the present invention, there is provided an information processing method comprising:

an input step of inputting first data; and

a step of storing predetermined third data and the first data input in the input step so as to associate the predetermined third data with the first data when second data associated with the first data input in the input step is identical to the predetermined third data,

wherein the first data is searched on the basis of the stored third data.

In another aspect, the invention provides an information processing method comprising:

an input step of inputting first data; and

a step of storing predetermined third data and the first data input in the input step so as to associate the predetermined third data with the first data when second data associated with the first data input in the input step is included in a category of the predetermined third data,

wherein the first data is searched on the basis of the stored third data.

In yet another aspect the invention provides an information processing method comprising:

an input step of inputting first data; and

a step of storing predetermined fourth data associated with predetermined third data and the first data input in the input step so as to associate the predetermined fourth data with the first data when second data associated with the first data input in the input step is identical to the predetermined third data,

wherein the first data is searched on the basis of the stored fourth data.

In yet another aspect the invention provides an information processing method comprising:

an input step of inputting first data; and

a step of storing predetermined fourth data associated with predetermined third data and the first

data input in the input step so as to associate the predetermined fourth data with the first data when second data associated with the first data input in the input step is included in a category of the predetermined third data,

wherein the first data is searched on the basis of the stored fourth data.

According to one embodiment, the foregoing object is attained by providing an information processing apparatus comprising:

input means for inputting first data; and

means for storing predetermined third data and the first data input by said input means so as to associate the predetermined third data with the first data when second data associated with the first data input by said input means is identical to the predetermined third data,

wherein the first data is searched on the basis of the stored third data.

In another embodiment of the invention, the foregoing object is attained by providing an information processing apparatus comprising:

input means for inputting first data; and

means for storing predetermined third data and the first data input by said input means so as to associate the predetermined third data with the first data when second data associated with the first data input by said input means is included in a category of the predetermined third data,

wherein the first data is searched on the basis of the stored third data.

In another embodiment of the invention, the foregoing object is attained by providing an information processing apparatus comprising:

input means for inputting first data; and

means for storing predetermined fourth data associated with predetermined third data and the first data input by said input means so as to associate the predetermined fourth data with the first data when second data associated with the first data input by said input means is identical to the predetermined third data,

wherein the first data is searched on the basis of the stored fourth data.

In another embodiment of the invention, the foregoing object is attained by providing an information processing apparatus comprising:

input means for inputting first data; and

means for storing predetermined fourth data associated with predetermined third data and the first data input by said input means so as to associate the predetermined fourth data with the first data when second data associated with the first data input by said input means is included in a category of the predetermined third data,

wherein the first data is searched on the basis of the stored fourth data.

According to another embodiment, the foregoing object is attained by providing an information equipment including input means for inputting information, storage means for storing the input information, and management means for selecting and processing the information to add associated information, the information equipment processing a second type of information having a first type of information as associated information and a third type of information having the first type of information as associated information, wherein said management means comprises comparison means for comparing the first type of information A associated with the third type of information with the first type of information B associated with the second type of information, and when a comparison result from said comparison means represents that the information A is identical to the information B or the information A is included in the information B, the second type of information is added to the associated information of the third type of information.

Other features and advantages of the present invention will be apparent from the following description taken in conjunction with the accompanying drawings, in which like reference characters designate the same or similar parts throughput the figures thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate embodiment of the invention and, together with the description, serve to explain the principles of the invention.

Fig. 1 is a perspective view showing an overall apparatus according to an embodiment;

Fig. 2 is a sectional view of the apparatus shown in Fig. 1;

Fig. 3 is a view showing a display example of a liquid crystal display device of the embodiment shown in Fig. 1;

Fig. 4A is a view for explaining a schedule data structure of the embodiment shown in Fig. 1;

Fig. 4B is a view for explaining a schedule data structure of the embodiment shown in Fig. 1;

Fig. 4C is a view for explaining a schedule data structure of the embodiment shown in Fig. 1;

Fig. 5A is a view showing a display example of the liquid crystal display device of the embodiment shown in Fig. 1;

Fig. 5B is a view showing a display example of the liquid crystal display device of the embodiment shown in Fig. 1;

Fig. 6A is a view showing a display example of the liquid crystal display device of the embodiment shown in Fig. 1;

Fig. 6B is a view showing a display example of the liquid crystal display device of the embodiment

shown in Fig. 1;
Fig. 6C is a view showing a display example of the liquid crystal display device of the embodiment shown in Fig. 1;
Fig. 7A is a diagram showing the arrangement of a comparison unit for adding information of the embodiment shown in Fig. 1;
Fig. 7B is a flow chart showing the operation algorithm of the comparison unit shown in Fig. 7A;
Fig. 8A is a view for explaining an image data structure of the embodiment shown in Fig. 1;
Fig. 8B is a view for explaining an image data structure of the embodiment shown in Fig. 1;
Fig. 9A is a view showing a display example of the liquid crystal display device of the embodiment in Fig. 1;
Fig. 9B is a view showing a display example of the liquid crystal display device of the embodiment in Fig. 1;
Fig. 9C is a view showing a display example of the liquid crystal display device of the embodiment in Fig. 1;
Fig. 9D is a view showing a display example of the liquid crystal display device of the embodiment in Fig. 1;
Fig. 10 is a block diagram showing a circuit for controlling the apparatus in Fig. 1;
Fig. 11A is a view showing underlined data in the associted data display screen shown in Fig. 5A;
Fig. 11B is a view showing an image data related to "Inoue"; and
Fig. 12 is a view showing another display example of Fig. 9B.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Preferred embodiments of the present invention will be described in detail in accordance with the accompanying drawings.

Fig. 1 is a perspective view showing the overall apparatus of an embodiment, Fig. 2 is a sectional view thereof, and Fig. 10 is a block diagram of an electric circuit. Reference numeral 1 denotes a notebook type electronic camera apparatus of an embodiment. The camera apparatus 1 comprises a camera body 3 and an upper lid 5. The camera body 3 is mechanically and electrically connected to the upper lid 5 through a hinge 4 by means of a known mechanism. A switch (not shown) is arranged in the hinge 4. The open/closed state of the upper lid 5 can be detected by the hinge 4. Various kinds of cards can be mounted in a card slot 9. New functions can be added to the camera body 3 in accordance with the contents of ROMs incorporated in the respective cards. That is, if a memory card MC incorporating an image recording memory and a camera control CPU is mounted in the card slot 9, the camera body 3 serves as an electronic camera.

The functions of the camera body in which the memory card MC is mounted will be described below.

The interior of the camera body 3 is arranged, as shown in Fig. 2. Reference numeral 2 denotes a photographic unit. The photographic unit 2 comprises a CCD 22 for photoelectrically converting an object image focused by a photographic lens 21, a diaphragm shutter 25, a low-pass filter 28, and an infrared cut filter 30. Reference numeral 31 denotes a focus control knob formed on a member for holding the photographic lens. When the focus control knob is vertically slid in Fig. 2, a distance between the photographic lens 21 and the CCD 22 is changed to perform focus control. The photographic unit is a known means, and a detailed description thereof will be omitted.

A signal extracted as an electrical signal by the photographic unit 2 is sampled by a known signal processing circuit 40 to obtain a video signal displayed on a liquid crystal display device 7 or data recorded in a memory 51 in the memory card MC. The signal processing circuit 40 also performs signal processing, e.g., processing for reproducing a video signal from the memory information to display video information recorded in the memory 51 on the liquid crystal display device 7.

The liquid crystal display device 7 displays various kinds of information. When the camera body serves as an electronic still camera, the liquid crystal display device 7 serves as an electronic viewfinder (EVF) as shown in Figs. 6A, 6B, and 6C to display a currently photographed image. A known electrostatic switch 44 is arranged on the display screen of the liquid crystal display device. When a pen (not shown) is brought into contact with the screen, the contact position on the screen is detected.

Reference numeral 15 denotes a release button for generating a photography start trigger; and 18, a power switch for ON/OFF-controlling the power supply of the camera body. A panel switch group 17 (Fig. 1) is arranged on the inner surface of the upper lid 5 and can be operated while the hinge 4 is set in an open state. Part of the panel switch group 17 is used for an electronic notebook function incorporated in a ROM 41 of the camera body, and the remaining part of the panel switch group 17 has functions changed depending on the types of cards mounted in the card slot 9.

The camera body 3 has a CPU 45, while the memory card MC has a CPU 50.

The CPU 50 controls the photographic unit 2, the signal processing circuit 40, the memory 51, and the like and performs the above camera operations.

The operations of the release button 15, the power switch 18, and the panel switch group 17 are detected by the CPU 45 in the camera body, and detection signals are transmitted to the CPU 50 in the memory card MC.

A built-in clock 43 for managing time is arranged in the camera body 3. As electronic notebook functions, a schedule function and a data management function for a telephone number, an address, and the like are prepared in the ROM 41 of the camera body. These programs are executed by the CPU 45 in the camera body 3.

The schedule and data (e.g., a telephone number and an address) are stored in a data memory 42 in the camera body 3.

Functions such as the schedule function which are associated with the present invention will be described below. Other functions can be constituted by known techniques, and a detailed description thereof will be omitted.

The operation of the schedule function of the apparatus of this embodiment will be described below. Fig. 3 shows the display screen of a schedule table of the liquid crystal display device 7 of this embodiment with reference to an example on January 22, 1993. In this display, a golf is scheduled from 8:00 to 17:00 on January 22, 1993, and a party is scheduled from 17:00 to 19:00. The current time obtained by the built-in clock is always displayed in an upper portion 7a of the liquid crystal display device 7.

Figs. 4A, 4B, and 4C are views for explaining schedule data. Fig. 4A shows the data structure of the schedule data. A schedule [n] consists of data m representing the number of included data and data (data type and contents). Fig. 4C shows an example of the contents of the schedule data shown in Fig. 3. Schedule [1] has seven data as associated data, i.e., event data "golf", time data "1993/01/22/08/00 -1993/01/22/17/00", person data "Yoshida", "Inoue", and "Goto", place data "ABC Gold Club", and other data "appointment: 6 o'clock, Shibuya". This data structure is illustrated in Fig. 4B. Similarly, as shown in Fig. 4B, schedule [2] has the following associated data: event data "party", time data "1993/01/22/17/00 -1993/01/22/19/00", person data "Yoshida", "Inoue", "Goto", "Arai", "Yamamoto", "Hamada", and "Aoyama", and place data "ABC Golf Club".

Numbers (data types) "0", "1", "2", "3", "4" following the above data represent the following data types respectively representing an event, time, a person, a place, and other data. When an input pen (not shown) is brought into contact with (to be referred to as "is operated at" hereinafter) a portion "golf" on the display screen in Fig. 3, the associated data is displayed, as shown in Fig. 5A. When the input pen is operated at a portion "party" on the screen, the associated data is displayed, as shown in Fig. 5B.

The above schedule function is executed by the CPU 45 in the camera body 3.

The operation of the camera function of the apparatus of this embodiment will be described below.

Fig. 6A shows the display screen of the liquid crystal display device 7 when the camera function is used. The liquid crystal display device 7 serves as an electronic viewfinder (EVF) for displaying images continuously photographed by an image pickup device. In addition, the current time counted by the built-in clock is displayed in the upper portion 7a of the liquid crystal display device 7. When a release switch is depressed in this state, the corresponding image is stored and recorded in the memory of the memory card MC.

At this time, the photographic time, i.e., 13:28, January 22, 1993 at which photography is performed as shown in Fig. 6B is automatically read by the CPU 45, transmitted to the CPU 50, and automatically recorded as associated data.

Schedule information is referred to to determine whether event data can be added. Fig. 7A is a view showing the function of a comparison unit C arranged in the CPU 45 of the camera body 3. The comparison unit C receives information A and information B and outputs the inclusion relation of these pieces of information. More specifically, when the contents of the information A are identical to those of the information B, the comparison unit C outputs "1". When the contents of the information A are included in those of the information B, the comparison unit C outputs "2"; otherwise, the comparison unit C outputs "3". Processing associated with addition of event data will be described with reference to a flow in Fig. 7B.

In step S1, photographic time (in this case, 13:28, January 22, 1993) is input to the information A (i.e., information A = "1993/01/22/13/28") . In step S2, n = 1 is set. In step S3, schedule time data is input to the information B. In step S4, the information A is compared with the information B by the comparison unit C. In schedule [1] shown in Fig. 4B, the information B is "1993/01/22/08/00 -1993/01/22/17/00", so that the information A is included in the information B. For this reason, the comparison result becomes "2". In step S5, an event "golf" is added as data associated with the image. In schedule [2] in Fig. 4B, since the information B is "1993/01/22/17/00 - 1993/01/22/19/00", the information A is not associated with the information B. For this reason, the comparison result becomes "3". In this case, the event is not added. In steps S6 and S7, loop control is performed to compare all the schedule data, and events are appropriately added.

The image data received by the apparatus 1 of this embodiment and the above additional information are stored in the memory 51 or the data memory 42. The stored data are referred to by a processing method to be described below.

The flow shown in Fig. 7B is executed by the CPU 45 in the camera body 3. The event information addition (S5) is performed such that event information to be added is transmitted from the CPU 45 to the CPU 50 in the memory card MC and the CPU 50 adds the event data to the corresponding image data and re-

cords the resultant data.

For example, when the input pen (not shown) is operated at a display screen portion "person" in Fig. 6B and a name of person (in this case, "Yoshida") is input, it can be recorded as associated data, as shown in Fig. 6C. When the input pen is operated at a display screen portion "place", and a name of place (in this case, "ABC Golf Club") is input, it can be recorded as associated data, as shown in Fig. 6C. In addition, when the input pen is operated at the "other data", and data is input, it can be recorded as associated data.

These processes are performed such that the CPU 45 in the camera body 3 detects the presence/absence of an operation, recognizes information to be added, and transmits it to the CPU 50 in the memory card MC, and the CPU 50 adds the additional data to the corresponding image data.

In the data structure of the above photographed image, as shown in Fig. 8A, an image [n] comprises data m representing the number of included data, data (data type and contents), and image data. An image shown in Fig. 6C has the following associated data: event data "golf", time data "1993/01/22/13/28", person data "Yoshida", and place data "ABC Golf Club". The data of image [1] can be illustrated, as shown in Fig. 8B.

A search process for image data with additional information generated by the apparatus of this embodiment will be described below.

Fig. 11A shows underlined data in the associated data display screen shown in Fig. 5A. The underlined data (e.g., "Inoue") indicates the presence of image data having data having the same contents (i.e., data "Inoue") as those of the underlined data as the associated data. For this reason, for example, when a portion "Inoue" is operated, the latest data is selected from the image data having "Inoue" as the associated data and is displayed (Fig. 11B). In addition, a search operation along the time axis can be performed using arrow keys in an upper right portion 7b.

When a command for displaying schedule data of January 22, 1993 is input from the panel switch group 17, the above image data with the additional information is searched, and a corresponding schedule table is displayed. As shown in Fig. 9A, to check a schedule screen display as a past schedule display, i.e., to check a schedule table of January 22 on January 24, an "image search" key is displayed in an upper right portion 7b of the liquid crystal display device 7. When this key is operated, a display shown in Fig. 9B appears. In this display, there are underlined data (e.g., "golf"). This indicates the presence of image data having time data included in the time data of the data "golf". For example, assume that a screen portion "golf" is operated. Since the data "golf" has time data "1993/01/22/08/00 -1993/01/22/17/00" as associated data, images having time data included in the time data of the data "golf" are searched and displayed from an image closest to "1993/01/22/08/00" (Fig. 9D). At this time, a search operation along the time axis can be performed using arrow keys in the upper right portion 7b. For example, if a photographer memorizes the date at which he played golf, an image can be efficiently searched by the above method. A method of searching an image when a photographer forgets the date at which he played golf will be described below. In the display state of Fig. 9B, when the photographer operates the "event" key in the upper right portion 7b, event information stored as associated data of the image data in the memory card MC is displayed (Fig. 9C). When the event data "golf" is operated, images having the data "golf" as associated information are searched and displayed from the latest one (Fig. 9D). At this time, a search operation along the time axis can also be performed using the arrow keys in the upper right portion 7b.

In the display state shown in Fig. 9B, when one of the "person" key, "place" key, and "other data" key in the upper right portion 7b is operated, a list of person information, place information, and other information stored as the associated data of the image data in the memory card MC are displayed in accordance with the operated search key. When given information "X" is operated in the list, images having the information "X" as the associated information are searched and displayed from the latest one.

These processes are also executed by the CPU 45 in the camera body 3. However, the CPU 50 performs read access to data stored in the memory card MC and sends necessary data to the signal processing circuit 40 and the CPU 45 in the camera body 3.

The display screen in Fig. 9B may be displayed, as shown in Fig. 12. When the "person" key in the upper right portion 7b is operated in Fig. 12, data indicating the presence of image data having the same person data as that having this data (e.g., "golf") is underlined and displayed (in this case, "party"). When a portion "golf" is operated, images having, as the associated data, the person data "Yoshida", "Inoue", and "Goto" having data "golf" are searched and displayed from the one closer to the time "1993/01/22/08/00 - 1993/01/22/17/00" (Fig. 9D). At this time, a search operation can be performed along the time axis using the arrow keys in the upper right portion 7b.

In this manner, when the "person" key is operated as the search data, and data is input as "golf", person data having the data "golf" as the associated data can be referred to and searched. For this reason, the search condition is an AND product of "golf" and "person", thereby efficiently searching the data. In this case, the search operation can be performed without memorizing a name of person.

The same operation as described above is performed in the state of Fig. 12 upon operations of the "location" key and "other data" key in the upper right

portion 7b.

Black marks 7d along a time axis 7c indicate schedule data representing periods during which image photography has been performed. When each mark 7d is operated, the corresponding images can be searched and displayed. Therefore, when a portion of about "13:00" in the black mark in Fig. 12 is operated, the image in Fig. 9D is searched.

Note that a method of performing a search operation using the "event", "person", "place", or "other data" key can be practiced without the schedule function (i.e., the function for displaying time and events in a table).

The image data and the corresponding additional information which are generated by the apparatus of this embodiment are recorded in the memory of the memory card MC. This serves as a very effective means when the memory card MC is subjected to a search operation by another search unit or the image data in the memory card MC are to be copied in a large-capacity recording unit and searched.

In the even information addition process shown in Fig. 7B, the information A is photographic time (date). However, the information A is not limited to this. For example, any information associated with a photographed image, such as a name of photographer and a name of photographic place may be used. If the information A is a name of photographer, a group name to which a plurality of photographers belong is assigned to the information B. If a name of photographer is included in the category of a predetermined group name (in the process of the comparison unit in Fig. 7A), this group name is added to the photographed image data and is stored. If the information A is a photographic place, a predetermined wider area to which a plurality of photographic places is assigned to the information B. If a photographic place is included in the category of the predetermined area (in the process of the comparison unit in Fig. 7A), this area name is added to the photographed image data and stored.

As has been described above, according to the present invention, an information equipment for processing a second type of information having a first type of information as associated information, and a third type of information having the first type of information as the associated information comprises a comparison means for comparing the first type of information A associated with the third type of information with the first type of information B associated with the second type of information. If a comparison result from the comparison unit represents that the information A is identical to the information B or the information A is included in the information B, the second type of information is added to the associated information of the third type of information. During photography, information for searching a photographed image can be automatically added, and therefore the recorded photographed image can be easily searched.

Assume photography is performed at given time in an information equipment for processing schedule information having time data as associated data and image information having photographic time as associated data. In this case, if schedule information representing the same time as the given time or including the given time is present, this schedule data is added to the photographed image information as associated data, so that the photographic contents can be labeled simultaneously with photography, thereby facilitating the subsequent image search operation.

The above embodiment of the present invention has exemplified a notebook type electronic camera which integrally includes a photographic function, a schedule function, a search function, and a reproduction function. However, these functions need not be integrally included to obtain the same effect as described above if a combination of these functions falls within the scope of the appended claims.

As many apparently widely different embodiments of the present invention can be made without departing from the spirit and scope thereof, it is to be understood that the invention is not limited to the specific embodiments thereof except as defined in the appended claims.

Claims

1. An information processing method comprising:
   an input step of inputting first data; and
   a step of storing predetermined third data and the first data input in the input step so as to associate predetermined third data with the first data when second data associated with the first data input in the input step is identical to the predetermined third data,
   wherein the first data is searched on the basis of the stored third data.

2. The method according to claim 1, wherein the first data is image data.

3. The method according to claim 2, wherein the second data represents time at which the first data is input in the input step.

4. The method according to claim 2, wherein the second data represents a name of person who inputs the first data in the input step.

5. The method according to claim 2, wherein the second data represents a place at which the first data is input in the input step.

6. An information processing method comprising:
   an input step of inputting first data; and

a step of storing predetermined third data and the first data input in the input step so as to associate the predetermined third data with the first data when second data associated with the first data input in the input step is included in a category of the predetermined third data,

wherein the first data is searched on the basis of the stored third data.

7. The method according to claim 6, wherein the first data is image data.

8. The method according to claim 6, wherein the second data represents time at which the first data is input in the input step, and

the third data represents a predetermined time interval.

9. The method according to claim 6, wherein the second data represents a name of person who inputs the first data in the input step, and

the third data represents a name of group to which a predetermined name of person belongs.

10. The method according to claim 6, wherein the second data represents a place at which the first data is input in the input step, and

the third data represents a name of area to which a predetermined place belongs.

11. An information processing method comprising:

an input step of inputting first data; and

a step of storing predetermined fourth data associated with predetermined third data and the first data input in the input step so as to associate the predetermined fourth data with the first data when second data associated with the first data input in the input step is identical to the predetermined third data,

wherein the first data is searched on the basis of the stored fourth data.

12. The method according to claim 11, wherein the first data is image data.

13. The method according to claim 12, wherein the second data represents time at which the first data is input in the input step.

14. The method according to claim 12, wherein the second data represents a name of person who inputs the first data in the input step.

15. The method according to claim 12, wherein the second data represents a place at which the first data is input in the input step.

16. The method according to claim 12, wherein the fourth data is event data associated with the third data.

17. An information processing method comprising:

an input step of inputting first data; and

a step of storing predetermined fourth data associated with predetermined third data and the first data input in the input step so as to associate the predetermined fourth data with the first data when second data associated with the first data input in the input step is included in a category of the predetermined third data,

wherein the first data is searched on the basis of the stored fourth data.

18. The method according to claim 17, wherein the first data is image data.

19. The method according to claim 17, wherein the second data represents time at which the first data is input in the input step, and

the third data represents a predetermined time interval.

20. The method according to claim 17, wherein the second data represents a name of person who inputs the first data in the input step, and

the third data represents a name of group to which a predetermined name of person belongs.

21. The method according to claim 17, wherein the second data represents a place at which the first data is input in the input step, and

the third data represents a name of area to which a predetermined place belongs.

22. The method according to claim 17, wherein the fourth data is event data associated with the third data.

23. An information processing apparatus comprising:

input means for inputting first data; and

means for storing predetermined third data and the first data input by said input means so as to associate the predetermined third data with the first data when second data associated with the first data input by said input means is identical to the predetermined third data,

wherein the first data is searched on the basis of the stored third data.

24. The apparatus according to claim 23, wherein the first data is image data.

25. The apparatus according to claim 23, wherein the second data represents time at which the first

data is input by said input means.

26. The apparatus according to claim 23, wherein the second data represents a name of person who inputs the first data by said input means.

27. The apparatus according to claim 23, wherein the second data represents a place at which the first data is input by said input means.

28. An information processing apparatus comprising:
input means for inputting first data; and
means for storing predetermined third data and the first data input by said input means so as to associate the predetermined third data with the first data when second data associated with the first data input by said input means is included in a category of the predetermined third data,
wherein the first data is searched on the basis of the stored third data.

29. The apparatus according to claim 28, wherein the first data is image data.

30. The apparatus according to claim 28, wherein the second data represents time at which the first data is input by said input means, and
the third data represents a predetermined time interval.

31. The apparatus according to claim 28, wherein the second data represents a name of person who inputs the first data by said input means, and
the third data represents a name of group to which a predetermined name of person belongs.

32. The apparatus according to claim 28, wherein the second data represents a place at which the first data is input by said input means, and
the third data represents a name of area to which a predetermined place belongs.

33. An information processing apparatus comprising:
input means for inputting first data; and
means for storing predetermined fourth data associated with predetermined third data and the first data input by said input means so as to associate the predetermined fourth data with the first data when second data associated with the first data input by said input means is identical to the predetermined third data,
wherein the first data is searched on the basis of the stored fourth data.

34. The apparatus according to claim 33, wherein the first data is image data.

35. The apparatus according to claim 33, wherein the second data represents time at which the first data is input by said input means.

36. The apparatus according to claim 33, wherein the second data represents a name of person who inputs the first data by said input means.

37. The apparatus according to claim 33, wherein the second data represents a place at which the first data is input by said input means.

38. The apparatus according to claim 33, wherein the fourth data is event data associated with the third data.

39. An information processing apparatus comprising:
input means for inputting first data; and
means for storing predetermined fourth data associated with predetermined third data and the first data input by said input means so as to associate the predetermined fourth data with the first data when second data associated with the first data input by said input means is included in a category of the predetermined third data,
wherein the first data is searched on the basis of the stored fourth data.

40. The apparatus according to claim 39, wherein the first data is image data.

41. The apparatus according to claim 39, wherein the second data represents time at which the first data is input by said input means, and
the third data represents a predetermined time interval.

42. The apparatus according to claim 39, wherein the second data represents a name of person who inputs the first data by said input means, and
the third data represents a name of group to which a predetermined name of person belongs.

43. The apparatus according to claim 39, wherein the second data represents a place at which the first data is input by said input means, and
the third data represents a name of area to which a predetermined place belongs.

44. The apparatus according to claim 39, wherein the fourth data is event data associated with the third data.

45. An information equipment including input means for inputting information, storage means for storing the input information, and management means for selecting and processing the informa-

tion to add associated information, the information equipment processing a second type of information having a first type of information as associated information and a third type of information having the first type of information as associated information, wherein said management means comprises comparison means for comparing the first type of information A associated with the third type of information with the first type of information B associated with the second type of information, and when a comparison result from said comparison means represents that the information A is identical to the information B or the information A is included in the information B, the second type of information is added to the associated information of the third type of information.

46. The equipment according to claim 45, wherein the first type of information is time data, and the third type of information is image data.

47. A recorder for audio, video and/or still pictures, wherein index information is stored electronically in association with recorded images or sound, automatically by reference to pre-stored schedule information.

48. An apparatus according to claim 47 further comprising means for searching by reference to the stored index information.

49. A method or apparatus having the features of any combination of the preceding claims.